

# **Retaining Army Engineer Officers**

**A Monograph  
by  
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## **Abstract**

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Policy and doctrine require the U.S. Army to provide certain capabilities during the conduct of stability operations. The Department of Defense now considers stability operations as critical to success as offensive and defensive operations. Operations that require technical engineer capabilities, specifically infrastructure reconstruction operations, require a portion of the engineer officer corps to possess a technical engineering education. Trends in officer accessions and retention indicate a shortfall in technical engineering education among the engineer officer corps, casting doubt in the ability of the Engineer Regiment to meet anticipated future requirements. Senior engineer leaders identified these conditions and initiated a campaign to increase technical competence within the regiment. This monograph contributes to this effort by identifying factors that affect the retention of engineer officers who possess engineering degrees. The results of a survey of engineer officers at Fort Leavenworth reveal these officers possess lower job satisfaction than officers who possess non-engineering degrees and officers across the Army. These officers are more likely to believe their experiences in the Army did not match their pre-commissioning expectations contributing to perceived “psychological contract violations.” The monograph suggests leaders conduct a series of studies over time to assess the effects of initiatives to increase technical competence within the Engineer Regiment.

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## Introduction

Above all, the Army provides combatant commanders with versatile land forces ready to fight and win the Nation's wars.

Field Manual 1, *The Army*, 2005

Within the context of current operations worldwide, stability operations are often as important as—or more important than—offensive and defensive operations.

Field Manual 3-0, *Operations*, 2008

The United States learned many hard lessons during the conduct of operations in Afghanistan and Iraq. Upon the conclusion of combat that resulted in the change of ruling regimes, both theaters became protracted efforts to support fledgling governments that faced significant hurdles. Inadequate and corrupt governance, insufficient security, weak institutions, and poor economic situations inhibited the Afghan and Iraqi government's ability to govern their nations and prevented the United States from withdrawing. The inability of the United States to set the necessary conditions for withdrawal was the subject of much analysis and debate. The result was the recognition that although the application of violence is required in the conduct of combat operations, non-lethal capabilities may be required to ultimately "win."

The position the United States military occupies in Afghanistan and Iraq, attempting to foster a host nation government embroiled in a protracted conflict, is not unique. The notion that the military can win battles, but lose the war has drawn comparison of the current fight in Afghanistan and Iraq to that of Vietnam.<sup>1</sup> The argument insinuates that the United States military focuses too heavily on fighting wars, not setting necessary conditions to win them. The military conducts actions not in a vacuum, but within unique social, economic, and political conditions. In

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<sup>1</sup> Jeffrey Record, *Beating Goliath: Why Insurgencies Win* (Washington, D.C.: Potomac Books, 2009), 67.

the 1990's, some argued the U.S military had been distracted by peacekeeping duties and should focus purely on high-intensity combat operations.<sup>2</sup>

Analysis of U.S. military operations reveals that while the military has fought eleven conventional wars, it has engaged in hundreds of operations of a more limited nature that required non-lethal actions.<sup>3</sup> Additionally, the military relied upon non-lethal capabilities at the conclusion of major combat operations in both Japan and Germany during World War II. The Department of Defense (DOD) now recognizes the importance of possessing a wide-range of capabilities, beyond defeating an enemy in battle. It has taken steps to increase competencies outside the domain of combat.<sup>4</sup>

The Army conceptualizes conflict as a spectrum, ranging from stable peace to general war. Within this spectrum, operational themes characterize military action, from peacetime military engagement to major combat operations. The Army's operational concept of full spectrum operations is the foundation of its doctrine. The concept employs offensive, defensive, and stability operations to achieve results within the spectrum of conflict.<sup>5</sup> Although lethal and non-lethal action is required during all operations, it is during stability operations that non-lethal capabilities are paramount. Experience in Afghanistan and Iraq reinforce the view that the military must possess and employ non-lethal capabilities.

Field Manual 3-0, *Operations*, defines stability operations as "An overarching term encompassing various military missions, tasks, and activities conducted outside the United States

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<sup>2</sup> Nina M. Serafino, "Peacekeeping and Related Stability Operations: Issues of U.S. Military Involvement," (Congressional Research Service Issue Brief for Congress, May 18, 2006), <http://www.handle.dtic.mil/100.2/ADA479080> (accessed October 7, 2009), Summary page.

<sup>3</sup> Lawrence A. Yates, *The US Military's Experience in Stability Operations, 1789-2005* (Fort Leavenworth: Combat Studies Institute Press, 2006), 2-3.

<sup>4</sup> U.S. Department of Defense, *Capstone Concept for Joint Operations, Version 3.0* (Washington, D.C.: U.S. Government Printing Office, 15 January 2009), Foreword.

<sup>5</sup> Headquarters, Department of the Army, *Field Manual 3-0: Operations* (Washington, D.C.: U.S. Government Printing Office, 2008), 2-1.

in coordination with other instruments of national power to maintain or reestablish a safe and secure environment, provide essential governmental services, emergency infrastructure reconstruction, and humanitarian relief.<sup>6</sup> Although stability operations involve the application of lethal means, the preponderance of capability employed during these operations may be non-lethal in nature. Policies and doctrine indicate these non-lethal capabilities, including reconstruction, can be as important as lethal capabilities in current and future conflicts.

It is necessary to understand that reconstruction operations are technical in nature. Although the Army has a “can-do” culture, there are aspects of reconstruction operations that it cannot overcome by sheer desire and motivation alone.<sup>7</sup> Certainly, many units in Afghanistan and Iraq tackled reconstruction projects that were outside of their core missions or expertise. However, such non-standard missions should be an exception as they assume risk. The assessment, design, and construction of infrastructure require an educated workforce to complete projects that are both safe and effective.

The Engineer Regiment is the primary organization in the Army that performs reconstruction operations. It depends on a cadre of officers that possess engineering degrees within the U.S. Corps of Engineers (USACE) and military engineering units. While there are indications the Army has an increased need for technical competence, several trends challenge the ability of the engineer regiment to maintain this necessary cadre of educated officers. Reports indicate that engineer units possess an insufficient number of qualified engineer officers to

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<sup>6</sup> Ibid., Glossary-13. Field Manual 3-0 shares the same definition of stability operations as Joint Publication 3-0, *Joint Operations*.

<sup>7</sup> For an articulation of the Army’s can-do culture, see remarks attributed to General Colin Powell: John F. Troxell, “Presidential Decision Directive-56: A Glass Half Full,” in *The Interagency and Counterinsurgency Warfare: Stability, Security, Transition, and Reconstruction Roles*, ed. Joseph R. Cerami and Jay W. Boggs (Carlisle: Strategic Studies Institute, 2007), 41-42. For a discussion of how this culture can have negative consequences, see: Fred Kaplan, “Challenging the Generals,” in *Military Leadership: In Pursuit of Excellence*, ed. Robert L. Taylor, William E. Rosenbach, and Eric B. Rosenbach (Philadelphia: Westview Press, 2009), 198.

conduct operations, resulting in capability shortfalls. Additionally, trends in officer accessions and retention indicate the engineer officer corps is less technically competent. In light of these trends, the retention of technically educated engineer officers is critical to prevent a shortfall in capability required during present and future conflicts. This perception, the need for engineer technical competence has increased, while technical competence of the engineer officer corps has degraded is not a conclusion of the author. Senior engineer leaders made this assessment. They initiated a campaign to access, train, and retain technically educated officers to close the capability gap.

The author analyzed this campaign's plan and sought to contribute towards its goal. The purpose of this monograph is to evaluate the ability of the Army Engineer Regiment to provide technical engineering capability in post-conflict environments. Specifically, it seeks to determine the factors that contribute to the retention of officers who possess technical engineering degrees required in the conduct of reconstruction operations. Why do engineer officers who possess technical engineering degrees stay in the Army? Perhaps the answer is these officers remain in the Army because they have had the opportunity to "use" their degree during their service.

This paper will first review the evolution of stability operations policy and doctrine. This will demonstrate that operations that require technical expertise are an integral part of stability operations, and that the Army has a responsibility to prepare for and execute these operations. This review will support the perception that the Army requires increased technical competence within its workforce. The paper will then explore the ramifications of this increased importance of a technically educated workforce. This will include an overview of the engineer regiment, a summary of indicators that contribute to the perception that a technical shortfall exists, and an explanation of current initiatives to retain technically educated officers. A literature review provides an overview of turnover models and concepts used to generate questions for the survey. The paper then presents the results of a survey of engineer officers. The survey population consisted of lieutenant colonels, majors and senior captains attending Intermediate Level

Education (ILE) and the School of Advanced Military Studies (SAMS), as well as serving in the Battle Command Training Program at Fort Leavenworth.

## **Indications – Increased Technical Capabilities are Required**

### **Pre-War Doctrine**

The Army's current concept of stability operations is a product of an evolution in policy and doctrine, shaped by experience and study, which deserves a brief account. The Army possessed stability operations doctrine prior to committing forces to the Global War on Terror (GWOT). It published Field Manual 100-5, *Operations*, in 1993. It describes "operations other than war" and relegates the topic to chapter 13 of the manual. It states, "The Army's primary focus is to fight and win the nation's wars. However, Army forces and soldiers operate around the world in an environment that may not involve combat."<sup>8</sup> This implies that application of violence is key to fighting and winning in war, and that operations that require non-lethal capabilities are not necessarily critical to winning and hence a separate and secondary capability. The Army possessed doctrine that dealt specifically with these "other" scenarios, including Field Manual 100-20, *Military Operations in Low Intensity Conflict*, and Field Manual 100-23, *Peace Operations*.

The Army included stability operations, along with offensive and defensive operations, as part of its concept of full spectrum operations in Field Manual 3-0, *Operations*, in 2001. This manual does not define stability operations, but presents characteristics of these operations. Stability operations is used as an umbrella term for all of the "other" activities the Army may participate in, including peace operations, security assistance, and humanitarian assistance.

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<sup>8</sup> Headquarters, Department of the Army, *Field Manual 100-5, Operations* (Washington, D.C.: U.S. Government Printing Office, 1993), 13-0.

## Post-Conflict Studies

Reflection on the post-conflict environment began before the protracted situations in Afghanistan and Iraq occurred. The U.S. Army War College's Strategic Studies Institute, in coordination with the Office of the Army Deputy Chief of Staff/G-3, initiated a study in October 2002, to analyze the requirements for U.S. and coalition forces after the war with Iraq. Titled "Reconstructing Iraq: Insights, Challenges, and Missions for Military Forces in a Post-Conflict Scenario," this study reviewed American post-conflict operations in small-scale contingencies and major wars in history and applied these insights to the situation in Iraq. It identified tasks required to create and maintain a viable state to facilitate the handover of authority to a new Iraqi regime.

The study conceptualized this transition within four phases: security, stabilize, build institutions, and handover/redeploy. It identified 135 essential tasks that would likely be required, and suggested which organizations should have primary responsibility for conducting these tasks throughout the four phases of transition.<sup>9</sup> Military forces are the primary organizations acting within the first phase, security. The authors realized that certain critical tasks must be conducted as soon as possible, and during this initial phase, the military is likely the only organization in position to perform these tasks. They identify thirty-five tasks deemed "critical" for the military to perform, tasks that military commanders must place emphasis and resources towards or risk mission failure. Of the thirty-five critical tasks, eight consist of reconstruction tasks related to infrastructure, i.e. the repair of roads, bridges, port facilities, airports, railroads, and water and gas systems.<sup>10</sup>

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<sup>9</sup> Conrad C. Crane and W. Andrew Terrill, "Reconstructing Iraq: Insights, Challenges, and Missions for Military Forces in a Post-Conflict Scenario," (Carlisle: Strategic Studies Institute, 2003), <http://www.strategicstudiesinstitute.army.mil/pdffiles/PUB182.pdf> (accessed October 7, 2009), 46-47.

<sup>10</sup> Ibid., 63-72.

The subsequent protracted nature of the situations in Afghanistan and Iraq spurred further study. The Center for Strategic and International Studies (CSIS) and Association of the United States Army (AUSA) conducted a three-year study analyzing U.S. strategy in post-conflict environments. It sought to determine what is required to rebuild countries after war, and how the U.S. can improve capacity in post-conflict reconstruction. Similar to the U.S. Army War College report, it analyzed past U.S. involvement in post-conflict operations but included contemporary interventions in Afghanistan and Iraq. An output was a “post-conflict reconstruction task framework” that presents the range of tasks that may be required to rebuild a country after war intended to “help identify shortfalls and gaps in reconstruction processes and capabilities.”<sup>11</sup>

The framework offers tasks between the halt of violent conflict and the return to normalization. It segments this transition with three phases: initial response, transformation, and fostering sustainability. The authors do not prioritize tasks, and are careful to state that each situation is unique and that local conditions will dictate which tasks are required and determine to what degree tasks require emphasis. Nor do the authors suggest which organizations should bear the responsibility for performing tasks. Similar to the U.S. Army War College study, the authors provide tasks across the myriad areas of security, governance, economic, and social requirements of a government in a post-conflict environment. It also includes tasks pertaining to infrastructure, which require engineering capabilities to perform. These include the restoration of power and access to roads, airports, rail lines, and ports.<sup>12</sup>

In 2005, the Office of the Coordinator for Reconstruction and Stabilization, U.S. Department of State (S/CRS), published the results of a study to determine reconstruction and stabilization essential tasks. Titled “Post-Conflict Reconstruction Essential Task List,” it

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<sup>11</sup> Robert C. Orr, ed., *Winning the Peace: An American Strategy for Post-Conflict Reconstruction* (Washington, D.C.: Center for Strategic and International Studies Press, 2004), 305.

<sup>12</sup> *Ibid.*, 317-320.

expanded upon the task framework offered by the CSIS and AUSA study. This document shares the same segmenting of transition within three phases: initial response, transformation, and fostering sustainability. It organizes tasks into five technical sectors: security, governance and participation, humanitarian assistance and social well-being, economic stabilization and infrastructure, and justice and reconciliation. The stated purpose of the framework is to aid those who are responsible for planning for reconstruction and stability.<sup>13</sup> The authors are careful to state these tasks are but a “menu” of possible issues in conflict-stricken countries, and that local conditions will determine priority and sequencing. Infrastructure tasks include the restoration of essential local public services, and the assessment, repair and construction of buildings and transportation networks.<sup>14</sup>

The aforementioned studies contributed to the formulation of new policies concerning the role of the U.S. government and military in stability operations. They also influenced the doctrine that followed policy changes. A commonality among the three is the need to rebuild infrastructure, ranging from national-level power generation projects to more local construction projects. From 2007-2008, the Army Training and Doctrine Command Analysis Center (TRAC) and Center for Army Analysis (CAA) conducted a gap analysis project that was a result of these subsequent policies. Their effort resulted in the publication of “Stability Operations Capability Gap Prioritization,” which identified capability gaps in stability operations environments.

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<sup>13</sup> U.S. Department of State, “Post-Conflict Reconstruction Essential Tasks,” (April 2005), <http://www.crs.state.gov/index.cfm?fuseaction=public.display&id=845541F4-EA4A-49BC-BDFC-53D8B8DE4865> (accessed October 7, 2009), preface.

<sup>14</sup> Ibid., I-1-V-8.

The TRAC report built upon previous efforts that had already identified eighteen stability operations capability gaps<sup>15</sup>, defined as a mission or task the Army does not have the units, personnel, equipment or training to accomplish. The project sought to prioritize five Tier 1 and thirteen Tier 2 capability gaps. Tier 1 gaps are tasks the Army must possess the capability and capacity to perform. Tier 2 gaps are tasks that another interagency organization is responsible for, but deemed critical enough to mission success that the Army must have the capability and capacity to perform.<sup>16</sup> The project leaders surveyed a group of officers with stability operations experience to prioritize these gaps. Two Tier 1 gaps and three Tier 2 gaps can be associated with the Engineer Regiment. The Tier 1 gaps are electricity and waste treatment, and the Tier 2 gaps are oil infrastructure, port dredging, and railways. The report states the Army has no engineer units or personnel capable of building, repairing or operating large-scale power plants, nor the engineer units or personnel with the training to build, repair or operate waste treatment facilities.<sup>17</sup> The report also acknowledges the lack of engineer capability and training to repair oil infrastructure and railways, and conduct dredging. The research team used Department of Defense Directive 3000.5, “Military Support for Stability, Security, Transition (SSTR), and Reconstruction” and National Security Presidential Directive 44, “Management of Interagency Efforts Concerning Reconstruction and Stabilization,” to define the Army’s role in stability operations.<sup>18</sup> This monograph discusses these documents in detail in the proceeding paragraphs.

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<sup>15</sup> Matt Koehler, William Krondak, and Jay Persons, “Stability Operations Capability Gap Prioritization,” (Fort Leavenworth: TRADOC Analysis Center, 2008), A-1. Previously held workshops utilized the U.S. State Department’s reconstruction and stabilization task matrix, mentioned previously.

<sup>16</sup> Ibid., 1.

<sup>17</sup> Ibid., A-2.

<sup>18</sup> Ibid., v.

## Relevant Policies and Concepts

The U.S has taken a whole of government approach to the conduct of post-conflict operations. This stems from the recognition that the military is neither equipped nor manned to adequately perform all of the tasks necessary to be successful in this environment. President Bush clarified the role of government by issuing National Security Presidential Directive 44 in December 2005. This directive outlined the responsibilities of the Department of State (DOS), DOD, and other executive departments and agencies concerning reconstruction and stability. It established the DOS as the lead agency for the planning and execution of operations, and directed coordination among the departments and agencies.<sup>19</sup>

In November of 2005, the Department of Defense published DOD Directive 3000.05, “Military Support for Stability, Security, Transition and Reconstruction (SSTR) Operations.” This directive established the policy that stability operations are a core mission of the U.S. military that is as important as combat operations. It defines stability operations as “Military and civilian activities conducted across the spectrum from peace to conflict to establish or maintain order in states and regions.”<sup>20</sup> Although host nation or civilian agencies ideally should lead such efforts, the military must be prepared to perform all tasks necessary. It directs the services to ensure that adequate programs exist to provide the quantity and quality of personnel required in stability operations. This policy directed the services to integrate stability operations into all aspects of their doctrine, training, education, leadership, personnel, and planning.

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<sup>19</sup> George W. Bush, "National Security Presidential Directive 44 (NSPD-44)," *Management of Interagency Efforts Concerning Reconstruction and Stabilization*, (Washington D.C.: The White House, December 7, 2005), 2.

<sup>20</sup> U.S. Department of Defense, “Department of Defense Directive Number 3000.05, Military Support to Stability, Security, Transition, and Reconstruction (SSTR) Operations, November 28, 2005,” [http://www.usaid.gov/policy/cdie/ss06/ss06\\_1\\_080106\\_dod.pdf](http://www.usaid.gov/policy/cdie/ss06/ss06_1_080106_dod.pdf) (accessed November 6, 2009), 2.

The Department of Defense uses Joint Operating Concepts to develop approaches to solving future defense challenges. They identify challenges, key ideas for solving those challenges, essential capabilities likely needed to achieve objectives and the relevant conditions in which the capabilities must be applied.<sup>21</sup> In 2006, the Department of Defense published the “Military Support for Stability, Security, Transition and Reconstruction Joint Operating Concept.” It states the joint force must possess the ability to conduct immediate reconstruction of critical infrastructure and essential services. The capabilities required include the ability to repair or construct roads, bridges, tunnels, and airfields, to repair or build buildings, water purification plants, electrical power generation grids, and sewage systems.<sup>22</sup>

The Department of Defense further clarified policy by issuing DOD Instruction 3000.05, “Stability Operations,” in 2009. It states the DOD will be prepared to “lead stability operations activities to establish civil security and civil control, restore essential services, repair and protect critical infrastructure, and deliver humanitarian assistance.”<sup>23</sup> It builds upon the earlier directive by providing the service secretaries additional responsibilities. This includes the requirement to identify and track personnel with stability operations-relevant skill sets and capabilities.<sup>24</sup>

## **Army Doctrine**

The Army subsequently published a revised Field Manual 3-0, *Operations*, in 2008. This manual reiterated the policy issued in DOD Directive 3000.05 that stability operations be given

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<sup>21</sup> U.S. Department of Defense, “JOpsC Family of Joint Concepts – Status Updates,” [http://www.dtic.mil/futurejointwarfare/concepts/concepts\\_exsums.ppt](http://www.dtic.mil/futurejointwarfare/concepts/concepts_exsums.ppt) (accessed November 17, 2009), 6.

<sup>22</sup> U.S. Department of Defense, “Military Support to Stabilization, Security, Transition, and Reconstruction Operations Joint Operating Concept, Version 2.0,” [http://www.dtic.mil/futurejointwarfare/concepts/ssstro\\_joc\\_v20.doc](http://www.dtic.mil/futurejointwarfare/concepts/ssstro_joc_v20.doc) (accessed November 7, 2009), 60.

<sup>23</sup> U.S. Department of Defense, “Department of Defense Instruction Number 3000.05, Stability Operations, September 16, 2009,” <http://www.dtic.mil/whs/directives/corres/pdf/300005p.pdf> (accessed November 17, 2009), 2.

<sup>24</sup> *Ibid.*, 13.

priority comparable to combat operations, and further states that at times they may be more important than offensive and defensive operations. This manual conceptualized stability operations, offensive operations, and defensive operations within the framework of full spectrum operations. It offered the first true definition of stability operations in Army doctrine as “An overarching term encompassing various military missions, tasks, and activities conducted outside the United States in coordination with other instruments of national power to maintain or reestablish a safe and secure environment, provide essential governmental services, emergency infrastructure reconstruction, and humanitarian relief.”<sup>25</sup>

The Army revised Field Manual 3-07, *Stability Operations and Support Operations*, and published it as *Stability Operations* in 2008. This manual included the five stability sectors advanced by S/CRS in 2005, and presented five corresponding primary military stability tasks: establish civil security, establish civil control, restore essential services, support to governance, and support to economic and infrastructure development.<sup>26</sup> It also offered the first definition of reconstruction in Army doctrine as “The process of rebuilding degraded, damaged, or destroyed political, socioeconomic, and physical infrastructure of a country or territory to create the foundation for long-term development.”<sup>27</sup>

Field Manual 3-34, *Engineer Operations*, published in 2009, provides engineer-specific responsibilities during the conduct of stability operations. The primary engineer focus in stability operations are general engineer operations supporting the restoration of essential services and infrastructure development. It provides likely engineer missions to be required, including the

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<sup>25</sup> Headquarters, Department of the Army, *Field Manual 3-0, Operations* (Washington, D.C.: U.S. Government Printing Office, 2008), Glossary-13.

<sup>26</sup> Headquarters, Department of the Army, *Field Manual 3-07, Stability Operations* (Washington, D.C.: U.S. Government Printing Office, 2008), 3-2.

<sup>27</sup> *Ibid.*, 1-12.

construction and repair of roads, sanitation facilities, and camps, clearance of obstacles and hazards, and power generation.<sup>28</sup>

The Department of Defense recognizes that non-lethal capabilities are required to create necessary conditions for the transition from war to peace. Stability operations is the concept of the activities the military, in conjunction with other government entities, conducts to facilitate this transition. Policy and doctrine regard reconstruction of infrastructure as a primary component of stability operations. The DOD directed the Army to provide capabilities to conduct reconstruction tasks during the conduct of stability operations.

## **Ramifications for the Engineer Regiment**

### **Overview of the Engineer Regiment**

An assessment of the evolving policy and doctrine concerning stability operations reveals that the assessment, repair, and construction of infrastructure are critical capabilities required during stability operations. These capabilities require a workforce that is proficient at technical engineering tasks. While the DOS has primary responsibility for the conduct of stability operations and associated reconstruction tasks, the DOD must possess the capability to perform these reconstruction tasks as required. The Engineer Regiment is the organization that possesses the preponderance of this capability in the Army. The engineer regiment consists of over 100,000 military and civilian personnel located within all Army engineer organizations, including military engineers, USACE, and Directorates of Public Works.<sup>29</sup>

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<sup>28</sup> Headquarters, Department of the Army, *Field Manual 3-34, Engineer Operations* (Washington, D.C.: U.S. Government Printing Office, 2009), 5-9.

<sup>29</sup> Department of the Army, Office of the Chief of Engineers, "Army Engineer Regiment: Providing full-spectrum support to the warfighter, installation commanders and the nation," [http://wood.army.mil/USAES/Building%20Great%20Engineers%20Content/STRATCOMS/Army\\_Eng\\_Regt\\_\(AER\)\\_brochure.pdf](http://wood.army.mil/USAES/Building%20Great%20Engineers%20Content/STRATCOMS/Army_Eng_Regt_(AER)_brochure.pdf) (assessed February 17, 2010)

Military engineers perform a variety of missions in support of combatant commanders. These forces consist of units embedded within Brigade Combat Teams (BCT), including BCT engineer companies and geospatial teams. Additional forces are available outside of BCTs, consisting of sapper, mobility augmentation, clearance, and construction units. Smaller specialized engineer forces, including diving, power, bridging, construction management, and canine units, provide further capability. These military engineer units exist within the Active Army, the National Guard, and Army Reserve.<sup>30</sup>

USACE consists of more than 30,000 civilians and 750 military engineers, organized in districts, divisions, and laboratories. This organization performs diverse engineering missions in support of the DOD and the nation. Missions include the design and construction of facilities on military installations worldwide, and the operation of U.S. inland waterways, harbors, and dams.<sup>31</sup> The Directorate of Public Works (DPW) is an organizational element of Installation Management Command (IMCOM), which manages Army installations. DPW is responsible for the operation of all 160 Army installations worldwide, including all buildings, roads, utilities, and land.<sup>32</sup>

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<sup>30</sup> Headquarters, Department of the Army, *Field Manual 3-34, Engineer Operations*, 2-3.

<sup>31</sup> Department of the Army, Office of the Chief of Engineers, “Army Engineer Regiment: Providing full-spectrum support to the warfighter, installation commanders and the nation.”

<sup>32</sup> Ibid.

Engineer Element		Force Provider			
		FORSCOM			
		Active Army	USAR	ARNG	Other ASCC
Organic Engineer Forces	BCT Engineer Company	m		m	m
	Geospatial Team	m		m	m
Engineer Headquarters	Engineer Battalion Headquarters	m	m	m	m
	Engineer Brigade Headquarters	m	m	m	m
	Theater Engineer Command		m		
Baseline Engineer Forces	Sapper Company	m	m	m	
	Mobility Augmentation Company	m	m	m	
	Clearance Company	m	m	m	
	Engineer Support Company	m	m	m	m
	Horizontal Construction Company	m	m	m	m
	Vertical Construction Company	m	m	m	m
	Multirole Bridge Company	m	m	m	
Specialized Engineer Forces	Survey and Design Team	m	m	m	*
	Concrete Section	m	m	m	
	Asphalt Team	m	m	m	
	Firefighting Team	m	m	m	
	Explosive Hazards Team or Coordination Cell	m		m	*
	Engineer Squad (Canine)	m		m	
	Diving Team	m		m	
	Topographic Company or Geospatial Planning Cell	m		m	*
	Construction Management Team	m	m	m	*
	Engineer Facilities Detachment		m	m	*
	Prime Power Company				m
	Well-Drilling Team			m	
	Quarry Platoon			m	
	Real Estate Team		m		*
	Forward Engineer Support Team				m

Note: \* USACE may provide some capabilities from its generating force organization.

**Table 1: Elements of the Engineer Regiment<sup>33</sup>**

Military engineer units vary and can perform a variety of functions during the conduct of full spectrum operations. Table 1 shows the types of military engineer elements within the regiment and their respective position within the force. Some units normally perform tasks that are primarily tactical, not technical in nature. This includes combat engineers located inside BCTs, and sapper, mobility augmentation, and clearance units. While these units possess capabilities that can contribute towards reconstruction operations, their primary purpose is to support close combat forces by enhancing maneuver and survivability.<sup>34</sup> The Engineer Regiment has determined that officers assigned to these units do not require a technical engineering

<sup>33</sup> Headquarters, Department of the Army, *Field Manual 3-34, Engineer Operations*, 2-3.

<sup>34</sup> *Ibid.*, 3-2.

degree.<sup>35</sup> Specialized engineer forces such as diving, firefighting, and quarry units possess capabilities that are suited to reconstruction operations. However, while the personnel in these units require specialized training, they do not require leaders that possess a technical engineering degree. Horizontal and vertical construction units, facilities detachments, prime power, and construction management teams possess capabilities that are required during reconstruction operations. Due to the technical nature of their missions, they would benefit from having officers assigned who possess a technical engineering degree.<sup>36</sup>

Through its Field Force Engineering (FFE) program, USACE leverages its capabilities and knowledge base to provide combatant commanders with technical engineering expertise during the conduct of stability operations.<sup>37</sup> It provides Facilities Engineer Support Teams (FEST) to deploy and augment engineer staff down to the BCT level. A military engineer typically commands these teams, which consist primarily of civilian engineers possessing specialties dependent upon the mission.<sup>38</sup>

This overview highlights the diversity of capabilities and missions of units within the Engineer Regiment. Since only a portion of the force performs missions that are technical in nature, the Army does not require that every officer possess a technical engineer education. In fact, 44.4% of the engineer officers surveyed for this monograph possessed an undergraduate engineering degree and 55.6% possessed a non-engineering undergraduate degree. This proportion may have been sufficient to meet requirements prior to operations in Afghanistan and

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<sup>35</sup> U.S. Army Engineer School, "ENFORCE 2008 Employment Working Group Outbrief," (Fort Leonard Wood: U.S. Army Engineer School, 2008), 8.

<sup>36</sup> Ibid., 9, 10.

<sup>37</sup> Michael A. Alexander, "The U.S. Army Corps of Engineers Support of Combatant Commanders," (Carlisle: U.S. Army War College, 2008), 4.

<sup>38</sup> Headquarters, Department of the Army, *Field Manual 3-34.400, General Engineering* (Washington, D.C.: U.S. Government Printing Office, 2008), 4-12.

Iraq. As stability operations policy and doctrine evolved during the conduct of these conflicts, the sufficiency of this proportion is in question.

## **Indications - Engineer Officer Technical Competence is Degrading**

The Army will seek to close the eighteen capability gaps identified in the TRAC report by training and equipping existing units, or creating new units. The Engineer Regiment is the organization likely responsible to provide the capabilities specifically mentioned above. These capabilities are technical in nature. The regiment is dependent on a technically educated officer corps to support these capabilities. Recent trends in engineer officer retention and accessions will challenge this effort.

In 2008, the United States Military Academy's Office of Economic and Manpower Analysis conducted a statistical analysis of engineer officer retention for the Engineer Regiment. It studied the continuation and retention rates of engineer officers in year groups 1995 through 1998. Among the findings was a comparison of engineer officer continuation of service to the Army officer average. The proportion of engineer officers who serve beyond six years of service is slightly below the Army average. The proportion of engineer officers who serve beyond eight years of service is significantly below the Army average.<sup>39</sup> The findings also revealed differences in the retention rates between officers who possess engineering degrees and those who do not. Engineer officers who possessed an engineering degree were more likely to leave active duty prior to eight years of service than those who do not. Additionally, officers who left active duty prior to eight years of service were more likely to possess an engineering degree from a top-tier university than those who remained.<sup>40</sup> Overall, degreed engineers are leaving the Army 35%

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<sup>39</sup> U.S. Army Engineer School, "Retention Working Group ENFORCE 9MAY08," (Fort Leonard Wood: U.S. Army Engineer School), 5.

<sup>40</sup> Ibid., 8.

faster than the Army average.<sup>41</sup> The accelerated departure of engineer officers with engineering degrees undermines the ability of the regiment to field technically competent officers to perform the stability operations tasked mentioned previously.

A number of additional trends have exacerbated this problem. First, the proportion of officers with engineering degrees accessed into the regiment has been declining for many years. In 1998, 54% of lieutenants accessed into the engineer regiment possessed an engineering degree. By 2007, the proportion had fallen to only 28%.<sup>42</sup> Second, assignments requiring officers who possess engineering degrees have been undermanned for years due to a shortage of engineers across the Army, especially in mid-grade assignments. The regiment considers these assignments, notably in USACE, as technical developmental assignments. Third, officers are less likely to pursue professional accreditation. The rate of field grade officers, those in the ranks of major through colonel, who possess a professional engineer license, fell from 19% in 2002 to 12% in 2007.<sup>43</sup>

The cause of the perceived degradation of engineer technical competency is outside the scope of this monograph. However, the effects of the Army Modular Force Initiative are likely a contributing factor. This initiative was the Army's most important transformational initiative that redesigned the operational Army from a division-centric force to one built around the BCT.<sup>44</sup> This initiative increased the number of BCTs, made possible by converting "less used structure" into additional infantry and high-demand capabilities. Although modularity increased the number

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<sup>41</sup> U.S. Army Engineer School, "G1 brief 31MAR09," (Fort Leonard Wood: U.S. Army Engineer School, 2009), 8.

<sup>42</sup> U.S. Army Engineer School, "Building Great Engineers Campaign Plan Brief 1AUG08," (Fort Leonard Wood: U.S. Army Engineer School, 2008), 10.

<sup>43</sup> U.S. Army Engineer School, "Building Great Engineers Campaign Plan," (Fort Leonard Wood: U.S. Army Engineer School, 2008), 3.

<sup>44</sup> U.S. Army Training and Doctrine Command, Office of the Chief of Public Affairs, "Modular Forces," [http://www.tradoc.army.mil/pao/web\\_specials/Leadership\\_of\\_Futures/modforce.htm](http://www.tradoc.army.mil/pao/web_specials/Leadership_of_Futures/modforce.htm) (accessed February 15, 2010)

of deployable BCTs, the capabilities of these BCTs to conduct full spectrum operations has been the subject of debate. Some argue that while well resourced for offensive and defensive operations, they possess limited stability operations capability.<sup>45</sup> Engineers in the active force helped to foot this bill, with over 19,000 Soldiers reduced from the force.<sup>46</sup> Additionally, military positions in Directorate of Public Works assignments converted to civilian positions. These assignments had traditionally been key technical developmental assignments for engineer officers.

## **Solution - Building Great Engineers Campaign**

Senior leaders within the Engineer Regiment recognized the increased importance of stability operations and the associated need for technical engineering capabilities. They are also aware of the trends in engineer officer accessions and retention that threaten the ability to provide these capabilities. The regiment initiated the Building Great Engineers campaign in 2008, which seeks to increase the number of officers accessed into the regiment who possess desired technical degrees, prepare them in a manner that prepares them for employment, and retain these officers. It recognizes this effort requires a holistic, long-term approach.

USACE began an investigation into the state of technical competencies in 2005. An output was a study by the Logistics Management Institute that identified factors specific to USACE that had contributed to a culture that did not foster competency development. USACE subsequently established a National Technical Competency Strategy and a team to implement

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<sup>45</sup> Andrew Feickert, "U.S. Army's Modular Redesign: Issues for Congress," (Washington D.C.: Congressional Research Service Report for Congress, Updated May 5, 2006), <http://fpc.state.gov/documents/organization/67816.pdf> (accessed February 15, 2010), 22. See also: Brian G. Watson, "Reshaping the Expeditionary Army to Win Decisively: The Case for Greater Stabilization Capacity in the Modular Force," <http://handle.dtic.mil/100.2/ADA434993> (accessed October 7, 2009), 12.

<sup>46</sup> Roger A. Wilson, "Campaign Quality Gap: Developing Strategic Engineering Competency," <http://handle.dtic.mil/100.2/ADA471317> (accessed October 12, 2009), 8.

initiatives to change this culture.<sup>47</sup> The Chief of Engineers, who commands USACE and has oversight of military engineers, asked the United States Army Engineer School to similarly investigate perceived declines in technical competency in active duty and reserve military engineers. The engineer school solicited participation from the United States Military Academy, Human Resources Command, and USACE, among others and established six working groups to investigate deficiencies and develop initiatives. Working under an effort titled “Engineer Leader Technical Competency Strategy,” these working groups comprised: future engineer missions, roles, methods of delivery, accessions, training and education, employment, retention, and strategic communications.<sup>48</sup> The working groups gathered initial evidence to support the perceived decline in technical competency, previously stated. The groups met during ENFORCE in 2008 at Fort Leonard Wood, an annual conference of Army engineer leaders. The theme of the conference was “Building Great Engineers.”

The engineer school published a campaign plan after this conference. It contains thirty-nine objectives intended to reverse the decline in engineer leader technical competency. The stated intent of the strategy is to “develop and implement an integrated, sustainable Building Great Engineer Plan which accesses, develops, employs and retains world-class engineer leaders who are technically and tactically capable to deliver full spectrum engineering in the 21<sup>st</sup> century.”<sup>49</sup> The thirty-nine action objectives each relate to the working group categories, specified above. Though tactical proficiency is a stated goal, none of the objectives supports this end. Further, the guiding principle of the campaign is “to develop a more technical workforce.”<sup>50</sup>

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<sup>47</sup> Brigadier General Gregg F. Martin and Colonel Jerry C. Meyer, “Join the Campaign: Engineer Leader Technical Competency,” *Engineer* (January-March 2008), 4.

<sup>48</sup> *Ibid.*, 6.

<sup>49</sup> U.S. Army Engineer School, “Building Great Engineers Campaign Plan,” 3.

<sup>50</sup> *Ibid.*, 3.

It is evident the aspects of the strategy are not discrete, but relate to and are dependent upon the other objectives. For example, the campaign plan states that retention actions link to employment and training and education aspects.<sup>51</sup>

Analysis of the working groups' briefing slides at ENFORCE and the campaign plan provides insight into how senior leaders considered the problem. It suggests that engineer officers leave service due to a reduction in battalion command opportunities due to the modular transformation initiative mentioned previously, lack of job satisfaction, and a lack of mentoring at the junior officer level.<sup>52</sup> Exit interviews with officers who have submitted paperwork for release from active duty provide such factors. Anecdotally, senior leaders believe that officers with engineering degrees leave the Army because they are not using their engineering degree. They believe such officers leave because they want to use their degree in the performance of their duties, but do not see such opportunities.<sup>53</sup>

It is apparent that senior leaders are considering why officers decide to leave the Army and are devising actions to retain them. Another way to approach the problem is to determine why officers stay in the Army. Such a determination may provide further insight into the factors that contribute to the stay/leave decision-making process. The campaign plan hypothesizes the stay/leave decision. It states the decision is a comparison between what officers expect to receive from staying in the Army and what they expect to receive from the civilian sector. Therefore, the engineer regiment should work to meet their expectations of service.<sup>54</sup> This view of the stay/leave decision is consistent with traditional models in turnover literature. Turnover is a multi-

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<sup>51</sup> Ibid., 8.

<sup>52</sup> U.S. Army Engineer School, "Retention Working Group ENFORCE 9MAY08," 16.

<sup>53</sup> U.S. Army Engineer School, "2009 Breakout group backbrief, ENFORCE 2009," (Fort Leonard Wood: U.S. Army Engineer School, 2009), 44, 46.

<sup>54</sup> U.S. Army Engineer School, "Building Great Engineers Campaign Plan," 8.

disciplinary field that is concerned with understanding the factors that contribute to employees leaving (or staying in) an organization. This literature provides other models and concepts of turnover that may provide insight into the stay/leave decision of engineer officers. This review informed the questions that comprised a survey of engineer officers.

## **Literature Review**

Turnover is a concept that has been the focus of much attention and research. Although employee turnover has always been relevant, it was not until the mid-20<sup>th</sup> century that researchers first presented and tested models in an attempt to learn why employees leave an organization. Since then, numerous models and concepts have emerged, and more than 1500 academic studies published in an effort to understand this phenomenon.<sup>55</sup> The purpose of this review is to provide a background of the models and major concepts that comprise the turnover literature. This discussion will present turnover models and concepts in chronological order.

What is turnover? Researchers have presented many definitions. Stated simply, it is the departure of an employee from his or her employer's organization, from which the employee received monetary compensation.<sup>56</sup> The cause of turnover can be either voluntary or involuntary. Voluntary turnover is the result of an employee's decision to leave an organization. Involuntary turnover is the result of an employer's decision to separate an employee from an organization. Voluntary turnover is the subject of more research than involuntary turnover. This is likely since the majority of turnover is voluntary, and that organizations can more easily control voluntary turnover than involuntary turnover.<sup>57</sup>

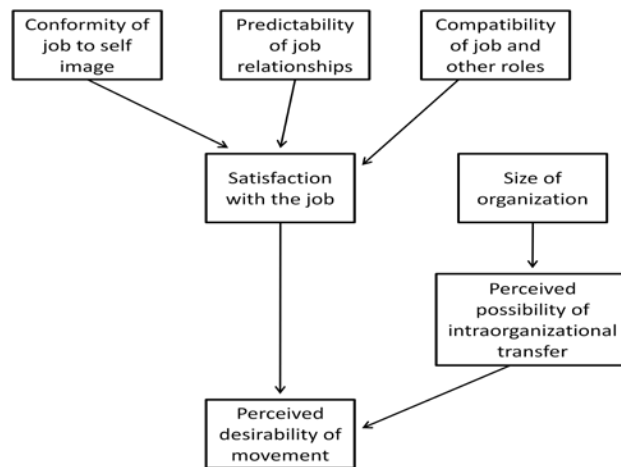
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<sup>55</sup> Brooks C. Holtom et al., "Turnover and Retention Research: A Glance at the Past, A Closer Review of the Present, and a Venture into the Future," *The Academy of Management Annals* Vol.2, No. 1 (2008): 232.

<sup>56</sup> William H. Mobley, *Employee Turnover: Causes, Consequences, and Control* (Reading: Addison-Wesley Publishing Company, 1982), 10.

<sup>57</sup> James L. Price, *The Study of Turnover* (Ames: The Iowa State University Press, 1977), 9.

It is appropriate to begin any discussion of turnover with March and Simon's seminal work, published in *Organizations* in 1958. March and Simon presented a theory of organizational equilibrium, which they suggest is based on employee motivation. Motivation is a function of a comparison of inducement and contribution utilities. Inducements are payments, salary and other benefits, that an employee perceives he or she receives in return for contributions made to the organization.<sup>58</sup> Organizational equilibrium exists when inducement and contribution utilities are equal. For example, an employee performs a certain function for an employer, for which they receive compensation. If the employee believes the value of their compensation is equal to the value of their efforts for their employer, the organization is in equilibrium. Further, an employee is less likely to leave an organization if they believe they receive more inducements from an organization than contributions they provide the organization. This inducements-contributions balance is a function of two major components: the perceived desirability of leaving an organization and the perceived ease of movement from an organization.<sup>59</sup>



**Figure 1. Major factors affecting perceived desirability of movement<sup>60</sup>**

<sup>58</sup> James G. March and Herbert A. Simon, *Organizations* (New York: John Wiley & Sons, Inc., 1958), 84.

<sup>59</sup> *Ibid.*, 93.

<sup>60</sup> *Ibid.*, 99.

March and Simon present the factors that affect perceived desirability of leaving an organization. The major factor affecting perceived desirability of leaving an organization is satisfaction with the job.<sup>61</sup> The greater an individual's satisfaction with the job, the less he or she desires to leave an organization. Satisfaction is comprised of three factors: conformity of the job to the employee's self-view, the predictability of relationships, and the compatibility of the job and other roles. An employee compares the characteristics of a job to his or her self-image. The employee is dissatisfied if they perceive a disparity between these perceptions. For example, if an employee values creativity, they will be dissatisfied with a job that does not require the application of this creativity. This assessment would negatively affect satisfaction and increase desirability to leave the organization. Satisfaction is also a function of predictability of relationships on the job. For example, a supervisor of an assembly line can reliably predict the type and quantity of components that are required for the assembly line's output. This predictability usually results in increased satisfaction. The final factor of satisfaction with the job is compatibility of work requirements with the requirements of other roles.<sup>62</sup> For example, an employee may have multiple supervisors, each of whom makes different and conflicting demands. The employee would reflect on this conflict negatively, causing a decrease in satisfaction.

Satisfaction with the job is the primary factor of perceived desirability of leaving an organization. March and Simon provide two other factors: size of the organization and perceived possibility of intraorganizational transfer.<sup>63</sup> These two factors act in concert to influence desirability of movement. An employee may perceive they have a greater opportunity for transfer within a larger organization than a smaller organization. Such a belief would reduce an

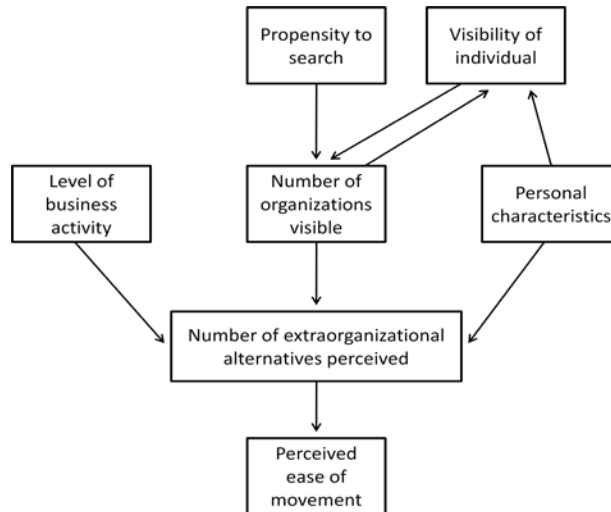
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<sup>61</sup> Ibid., 94.

<sup>62</sup> Ibid., 95.

<sup>63</sup> Ibid., 98, 99.

employee's desire to leave an organization since they would have alternative jobs within the organization. Such a transfer may result in a job that better conforms to their self-image, is more predictable in terms of job relationships, or is with more compatible work requirements.



**Figure 2. Major factors affecting perceived ease of movement<sup>64</sup>**

March and Simon present the factors that affect perceived ease of movement from an organization. The major factor affecting perceived ease of movement from an organization is the number of external job opportunities an employee perceives. The greater the number of opportunities perceived, the more likely an employee will believe that leaving the organization is possible. This perception of external opportunities is itself comprised of three factors: the level of business activity, the number of external organizations visible to the employee, and the personal characteristics of the employee.

March and Simon consider the state of the economy to be the most accurate single predictor of turnover.<sup>65</sup> The state of the economy influences all of the factors that affect perceived ease of movement from an organization. Level of business activity can be associated with the

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<sup>64</sup> Ibid., 106.

<sup>65</sup> Ibid., 100.

unemployment rate. When the unemployment is higher, an employee is less likely to have external employment opportunities. Conversely, when unemployment is lower, an employee may perceive an increase in the number of external employment opportunities, thus increasing their perceived ease of movement from the organization. The greater the number of external organizations visible to an employee, the more likely the employee will perceive an acceptable opportunity. This visibility is a function of the employee's propensity to search and his or her own visibility to external organizations. March and Simon consider job satisfaction to be the most influential component of propensity to search.<sup>66</sup> Employee visibility and the number of organizations visible to the employee are reciprocal variables. An employee that scans the external environment for opportunities will increase his or her own visibility to potential employers, thus increasing the number of opportunities perceived. Conversely, the less an employee scans the environment, the less visible the employee will be to external organizations, resulting in less perceived opportunities. The final factor of perceived ease of movement is the personal characteristics of the employee. March and Simon cite previous research and assert that sex, age, social status, and length of service influence the number of external opportunities an employee will perceive.<sup>67</sup>

March and Simon's model of voluntary turnover influenced subsequent research. Later theorists expanded their model of motivation in an attempt to understand the turnover phenomenon. Their concepts of perceived desirability of movement from an organization and ease of movement from an organization influenced the contemporary concepts of job satisfaction and perceived opportunities.<sup>68</sup>

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<sup>66</sup> Ibid., 103.

<sup>67</sup> Ibid., 101, 102.

<sup>68</sup> Holtom et al, "Turnover and Retention Research: A Glance at the Past, A Closer Review of the Present, and a Venture into the Future," 237.

After March and Simon's first model, Porter and Steers (1973) were the next researchers to present a model to explain turnover. They critically examined the turnover literature advanced since March and Simon and demonstrated this research further supported the strong negative correlation between job satisfaction and withdrawal. Porter and Steers believed that job satisfaction was an important turnover factor, but researchers had not sufficiently explored its components. They proposed that job satisfaction is composed of four components that relate to withdrawal behavior: organization-wide factors (e.g. pay and promotion), immediate work environment factors (e.g. supervisory style), job-content factors (e.g. job autonomy and responsibility), and personal factors (e.g. age and personality characteristics). These categories represent "levels" of the organization, in any of which factors can be present to affect withdrawal.<sup>69</sup>

Porter and Steers proposed met expectations as a conceptual framework to explain the factors of turnover.<sup>70</sup> Each employee brings his or her own, unique expectations to an employment situation. The job must substantially meet these expectations if the employee is to remain in an organization. Porter and Steers propose that these individual sets of expectations can change over time in response to rewards and available alternatives. Their decision to continue employment or seek alternatives outside the organization is a result of evaluating their job satisfaction. Job satisfaction is proposed to be the sum total of an individual's met expectations on the job.<sup>71</sup> The employee's decision to stay in the organization or to leave is surmised to be a process of balancing received and potential rewards with desired expectations.<sup>72</sup>

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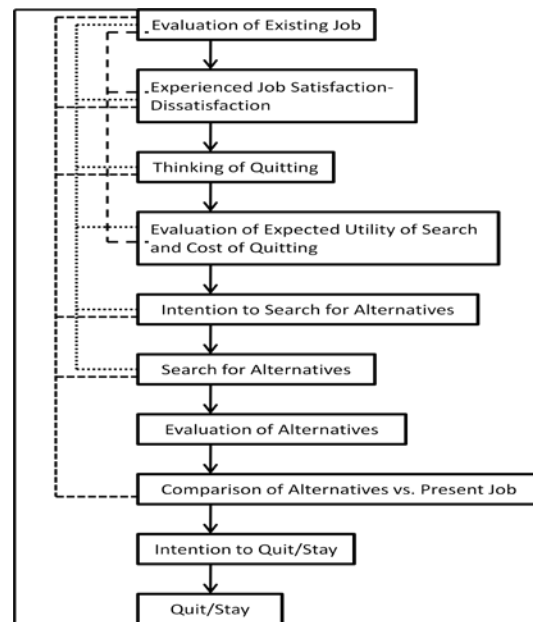
<sup>69</sup> Lyman W. Porter and Richard M. Steers, "Organizational, Work, and Personal Factors in Employee Turnover and Absenteeism," *Psychological Bulletin* Vol. 80, No. 2 (1973): 169.

<sup>70</sup> Ibid., 151.

<sup>71</sup> Ibid., 169.

<sup>72</sup> Ibid., 171.

In their conclusion, Porter and Steers asserted that further research was required to understand employee withdrawal as a process.<sup>73</sup> Mobley (1977) attempted to fill this need. His intermediate linkages model depicted voluntary turnover as an employee decision-making process. Earlier work, including that of March and Simon focused on the direct link between job satisfaction and turnover. Mobley sought to expand the knowledge of what an employee considers between evaluating satisfaction and the act of quitting.<sup>74</sup> His model suggested what intermediate steps may exist between this initial evaluation and actual quitting (e.g. thinking of quitting, searching for alternatives). Later theorists termed these steps withdrawal cognitions and job-search behaviors.<sup>75</sup>



**Figure 3. The employee turnover decision process<sup>76</sup>**

<sup>73</sup> Ibid., 173.

<sup>74</sup> William H. Mobley, "Intermediate Linkages in the Relationship Between Job Satisfaction and Employee Turnover," *Journal of Applied Psychology* Vol. 62, No. 2 (1977): 237.

<sup>75</sup> Holtom et al, "Turnover and Retention Research: A Glance at the Past, A Closer Review of the Present, and a Venture into the Future," 237.

<sup>76</sup> William H. Mobley, "Intermediate Linkages in the Relationship Between Job Satisfaction and Employee Turnover," 238.

Mobley et al. (1979) presented an expanded model of the employee turnover process. It depicted individual, organizational, and environmental variables that influence the turnover phenomenon. The model graphically demonstrates the interaction among these variables, and suggests four primary determinants of intentions to quit: job satisfaction, expected utility of alternative opportunities within the organization, expected utility of alternative opportunities outside the organization, and non-work values.<sup>77</sup>

Mobley et al. conceptualize job satisfaction as an evaluation of the job involving a comparison of employee work values and the employee's perception of what the job provides.<sup>78</sup> Satisfaction will increase if the employee perceives the job provides what he or she values. Satisfaction will decrease if the employee perceives the job does not provide what is valued. Similar to Porter and Steers, Mobley et al. believe that satisfaction can vary greatly from individual to individual. For example, an employee may value job variety and will then evaluate a job based on these values. Conformity of the job to these values will enhance job satisfaction. Conversely, if the nature of the job does not conform to these values, an assembly line position for example, then job satisfaction will be degraded. In addition to being highly individualized, satisfaction is dependent upon employee perceptions.<sup>79</sup> It is possible that a job does provide what an employee values, yet the employee will be dissatisfied if he or she does not recognize it. For example, if the employer of the assembly line worker in the previous example were to begin a work rotation plan, the employee would have the opportunity to perform different tasks along the assembly line. However, if the employee does not recognize this plan as an opportunity for job variety, he or she will not perceive the job to conform to this important value. Another aspect of satisfaction is that individuals possess many values. It is unlikely that any one particular value

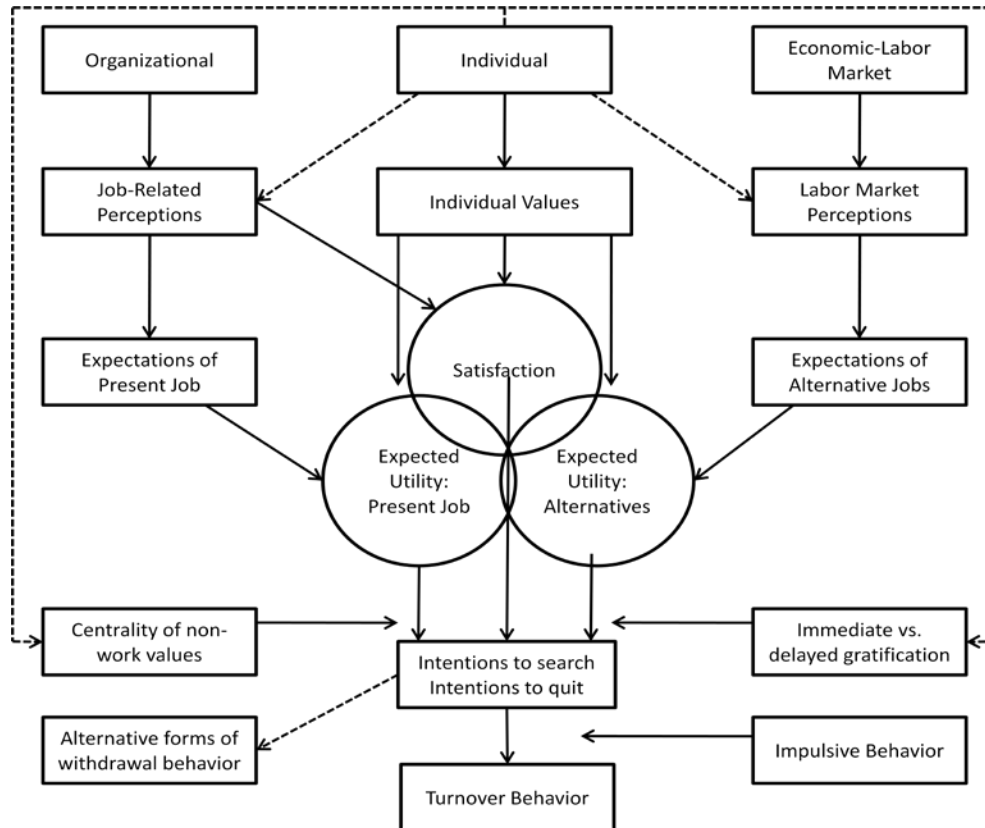
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<sup>77</sup> William H. Mobley, *Employee Turnover: Causes, Consequences, and Control*, 125.

<sup>78</sup> *Ibid.*, 125.

<sup>79</sup> *Ibid.*, 127.

will control satisfaction unless it is extremely important to the individual. Mobley et al. assert that an employer must endeavor to understand what its employee's value in order to implement strategies designed to retain them.<sup>80</sup>



**Figure 4. An expanded model of the employee turnover process<sup>81</sup>**

The expanded model considers job satisfaction to be a present evaluation of a job. It also offers determinants that relate to future expectations: the expected utilities of alternative opportunities within and external to the organization. An employee may currently be dissatisfied with the job, yet not withdraw even if other opportunities are available outside the organization. This can be a result of expected changes in the present job (i.e. different work characteristics and change in supervisor), the possibility of a transfer to a new job, a promotion, or changes in pay or

<sup>80</sup> Ibid., 128.

<sup>81</sup> Ibid., 126.

benefits. An important aspect is that currently satisfied employees may have negative expectations about their future in an organization. A satisfied employee may regard one of the expected changes previously listed as unwelcome. Employees also assess the possible conformity of their values to opportunities outside their current organization. This expected utility is dependent upon the employee's work values, their assessment of whether an external job can fulfill these values, and their expectation of being able to attain the external jobs.<sup>82</sup>

The determinants of satisfaction, and expected utility of internal and external jobs are dependent upon an individual's work values. Mobley et al. propose the final factor in the employee turnover process to be non-work values. They propose that employees that regard non-work values higher than work values will consider a turnover decision differently than an employee whose central life values are work related. Examples of non-work values include family considerations and life-style and geographical preferences.<sup>83</sup>

Price (1977) was a contemporary of Mobley who sought to codify the existing determinants and variables of turnover. He defined determinants as analytical variables believed to produce variations in turnover.<sup>84</sup> He identified five determinants of turnover: pay, integration, instrumental communication, formal communication, and centralization. He regarded all other variables discussed in the turnover literature as correlates, indicators related to turnover.<sup>85</sup>

Price asserted that higher amounts of pay would probably produce lower amounts of turnover. He includes in pay all benefits that an employee receives from an employer, so this determinant is similar to March and Simon's term of inducements. He differentiates between amount of pay and satisfaction with pay. Pay is the amount an employee receives, an objective

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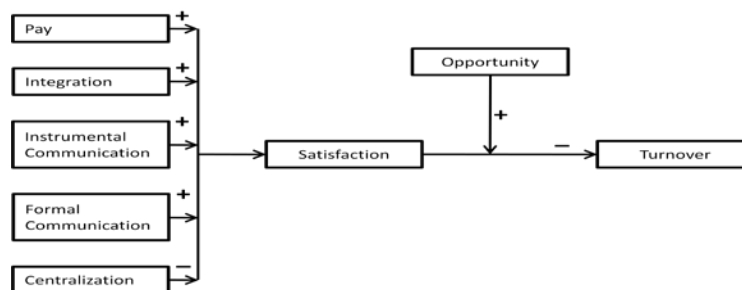
<sup>82</sup> Ibid., 129.

<sup>83</sup> Ibid., 130.

<sup>84</sup> James L. Price, *The Study of Turnover*, 66.

<sup>85</sup> Ibid., 24.

variable, and satisfaction with pay is an employee's psychological response, a subjective variable. The second determinant that Price identifies is integration. He defines integration as the extent of participation in relationships.<sup>86</sup> Employees interact with co-workers, proximate family members, and others that influence his or her decision to remain in an organization. He asserts that higher amounts of integration will probably result in lower amounts of turnover. Communication is a determinant that includes both instrumental and formal communication. Communication is the degree to which information is transmitted among members of an organization.<sup>87</sup> Instrumental communication is the transmission of role performance information (e.g. performance evaluation counseling). Formal communication includes any transmission between representatives of the employer and the employee, excluding that of peers and co-workers. Price asserts that higher amounts of both types of communication will result in lower amounts of turnover. The final determinant of turnover is centralization, the degree to which power is concentrated in an organization. This term is similar to the correlate of "participation in decision-making" that exists in turnover literature. He asserts that higher amounts of centralization will result in higher amounts of turnover.<sup>88</sup>



**Figure 5. Relationships between the determinants, intervening variables, and turnover<sup>89</sup>**

<sup>86</sup> Ibid., 70.

<sup>87</sup> Ibid., 73.

<sup>88</sup> Ibid., 76.

<sup>89</sup> Ibid., 84.

Price's model includes two variables that intervene between the previously discussed determinants and turnover. The first variable, satisfaction, occurs before the second variable, opportunity. Price defines satisfaction as the degree to which members of an organization have a positive orientation towards membership.<sup>90</sup> He asserts that satisfaction is a product of the five determinants he identified. For example, an employee who is satisfied with his or her amount of pay is more likely to have a higher degree of overall job satisfaction. In this case, the variable of satisfaction intervened between the determinants and turnover. The second intervening variable is opportunity. Price defines opportunity as the availability of alternative roles in the environment.<sup>91</sup> Similar to March and Simon, he considers the state of the economy, namely the availability of employment, as a principal component of opportunity. Although Price identified two intervening variables, satisfaction and opportunity, he concurred with previous researchers that satisfaction is the primary intervening variable in turnover.<sup>92</sup>

Price subsequently collaborated with Mueller (1981) to explore further his model. Price's previous work was a proposed model based on a critical review of the turnover literature. Price and Mueller then developed a causal model of turnover incorporating additional determinants and intervening variables. Since the newer model is an expansion of the previous discussion, the author will only identify those components that further contributed to the understanding of turnover. Price and Mueller added intent to stay as an intervening variable between satisfaction and turnover. This addition was a result of incorporating research in organizational commitment that took place since the introduction of the previous model. This research suggested that organizational commitment, or intent to stay, was significantly and negatively related to

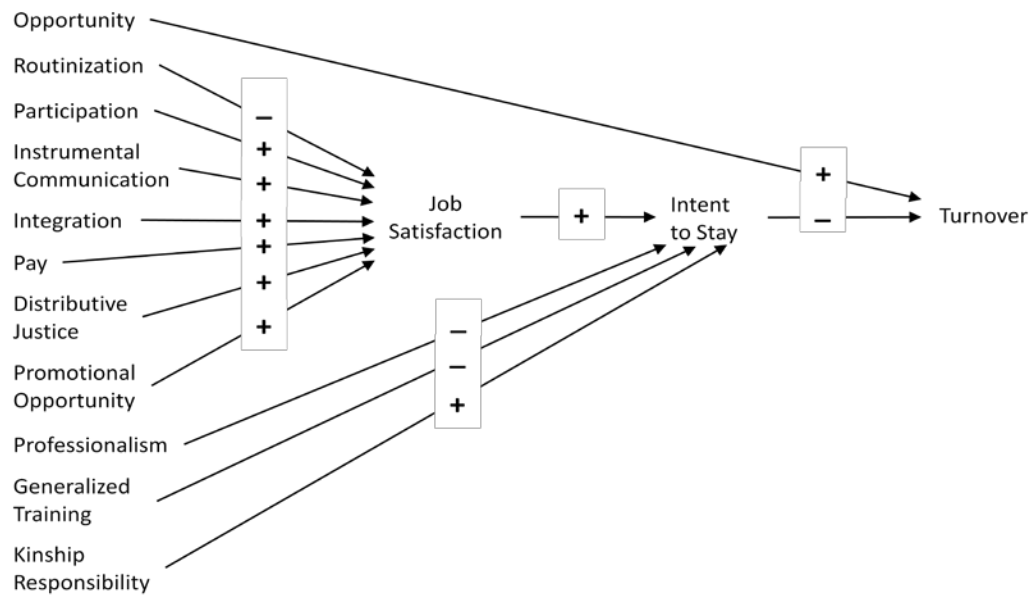
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<sup>90</sup> Ibid., 79.

<sup>91</sup> Ibid., 81.

<sup>92</sup> Ibid., 79.

turnover.<sup>93</sup> They added additional determinants to the model. An example is routinization, the degree to which a job is repetitive in nature. They also reconsidered existing determinants.



**Figure 6. The causal model of turnover<sup>94</sup>**

Centralization, which represented the degree to which power is exercised in an organization, was reevaluated. Power was represented as participation, which referred to the amount of control an employee felt he or she exercised in an organization. This causal model contributed to the literature by further investigating the antecedents of job satisfaction.<sup>95</sup>

This review of turnover literature has provided insight into the factors and processes concerning why employees leave organizations. These concepts are certainly relevant to an employer seeking to reduce the amount of employees who leave. However, just as relevant would be concepts that attempt to explain why employees remain in organizations. Mitchell et al. (2001)

<sup>93</sup> James L. Price and Charles W. Mueller, "A Causal Model of Turnover for Nurses," *Academy of Management Journal* Vol. 24, No. 3 (1981): 547.

<sup>94</sup> Ibid., 547.

<sup>95</sup> Holtom et al, "Turnover and Retention Research: A Glance at the Past, A Closer Review of the Present, and a Venture into the Future," 239.

endeavored to accomplish this when they proposed their job embeddedness construct. It is a departure from the traditional model focus on employee attitudes and alternatives. Job embeddedness is a web of influence that can cause an employee to feel “stuck” in an organization. An employee who perceives more links to his or her environment is proposed to be more embedded than one who perceives less links. Job embeddedness is highly individualized and classified as links, fit, and sacrifice. Links are formal or informal connections between an employee and the organization, or the employee and other people. These connections are “strands” that connect a person socially, psychologically, and financially to a web that includes people inside and outside an organization.<sup>96</sup> For example, an employee may have daily contact with co-workers. He or she may regard some of them as acquaintances and others as friends. He or she may meet socially after work or on weekends with each other’s family. Different employees do not value all of these links the same, but the more links between a person and the web, the more bound the person is to the job.

Mitchell et al. define fit as the employee’s perceived compatibility or comfort within an organization and environment.<sup>97</sup> An employee’s values and goals must fit with the culture and demands of his or her job. Different employees may perceive the same condition differently. For example, two employees may have the same type of job in the same organization. Perhaps this position does not offer much possibility for advancement. One employee may be content with this policy and not desire further responsibility. This evaluation would contribute positively to the employee’s person-organization fit. The second employee may hold more ambitious career aspirations and not be satisfied with this policy. This would contribute negatively to this

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<sup>96</sup> Mitchell et al., “Why People Stay: Using Job Embeddedness to Predict Voluntary Turnover,” *Academy of Management Journal*, Vol. 44, No. 6 (2001): 1104.

<sup>97</sup> *Ibid.*, 1104.

employee's person-organization fit. The more an employee perceives they fit with the organization and environment, the less likely the employee will seek to leave the organization.

Sacrifice represents what an employee will forfeit if they leave an organization. This includes salary, benefits, friendships, or anything an employee currently values. Also relevant is the "hassle" involved with leaving the organization, including the tasks associated with moving, uprooting a family from an area to a new one, and learning to operate in a new environment. Sacrifice also captures the perceived lack of job stability and seniority that can be present in the existing organization. Non-work factors advanced by Price and Mueller and "organization-focused predictors," a grouping of factors that include Price's determinant of integration all influenced the concept of job embeddedness.<sup>98</sup>

The field of work and organizational psychology contributes to the turnover literature. Since voluntary turnover involves the mental processes of employees, research in this field can offer further insights into why employees stay in or leave organizations. The concept of psychological contracts is the last turnover concept presented in this literature review. Psychological contracts are exchange relationships between an employee and an employer. Theorists have advanced several definitions, though generally they define them as the unwritten, informal, implicit expectations of employment held by an employee prior to entering an organization.<sup>99</sup> Psychological contracts inevitably form since it is not possible to articulate all the possible aspects of the employment relationship in a formal, written contract.<sup>100</sup> A prospective employee usually forms perceptions prior to entering an organization of what a job will be like. While interacting with the employer, the prospective employee will refine his or her expectations

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<sup>98</sup> Ibid., 1103.

<sup>99</sup> Neil Anderson and Rene Schalk, "The Psychological Contract in Retrospect and Prospect," *Journal of Organizational Behavior* 19 (1998): 638.

<sup>100</sup> Ibid., 640.

based on explicit and implicit employer input. The resulting “pre-entry expectations”<sup>101</sup> then form the paradigm the prospective employee will compare his or her experiences to upon entry into the organization. For example, an individual may seek a job in corporate finance. He or she may have held previous positions in this field. After finding an offer for a job online and reading the job description, he or she will form a view of what this job would be like. During the interview with the employer, the representative of the employer will convey further information about the nature of the job, not all of which are expressed in the job description. This information will contribute to the employee’s conception of the job and will create a psychological contract between the employee and the employer.

An employee enters an organization and compares his or her on-the-job experiences to their pre-entry expectations. If these “post-entry experiences” are sufficiently different from the pre-entry expectations, the employee could perceive that a contract violation has occurred.<sup>102</sup> This relationship is similar to Porter and Steer’s met expectations concept described previously. A perceived psychological contract violation can lead to feelings of betrayal and negatively affect job satisfaction, possibly leading to turnover. For example, consider the employer in the example above hired the applicant to fill the finance position. Perhaps the employee expected a great deal of autonomy to conduct his or her duties, based upon her previous experience or based on what the employer representative stated or implied. If upon entry he or she instead were subject to intense supervision, the employee would have basis to believe the employer was disingenuous. Such a feeling could result in a feeling of betrayal, and reduce the employee’s job satisfaction. It

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<sup>101</sup> Gigi Sutton and Mark A. Griffin, “Integrating Expectations, experiences, and psychological contract violations: A longitudinal study of new professionals,” *Journal of Occupational and Organizational Psychology* 77 (2004): 494.

<sup>102</sup> *Ibid.*, 496.

is important to understand that psychological contracts are subjective, different from employee to employee, and dynamic, changing over time.<sup>103</sup>

The literature review provides a background of the major models and concepts that comprise the turnover literature. These models and concepts became more refined over time, as theorists researched and elaborated upon work advanced previously. An understanding of this interrelatedness is necessary to appreciate the nature of the questions and the analysis of the survey. The author will identify the models and concepts utilized to generate the survey, and present the objectives of the survey.

## Survey

The purpose of the survey is to explore the stay/leave decision-making process of Army engineer officers. The research question is why do engineer officers who possess engineering degrees stay in the Army? Perhaps they chose to remain in the Army because they have had the opportunity to “use” their degrees during their service. The survey seeks to answer the research question by posing questions to respondents informed by the expanded model, job embeddedness, and psychological contracts.

The survey did not include questions that specifically related to deployments to theaters of war. The effects of deployments on retention in the post-September 11<sup>th</sup> era are mixed. A Congressional Budget Office report published in 2005 states that some studies found that deployments had no effect on retention, while in other studies they were associated with lower retention.<sup>104</sup> A report published by the Congressional Research Service in 2006 examined the potential factors contributing to a shortfall in officer personnel strength. This report concluded,

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<sup>103</sup> Neil Anderson and Rene Schalk, “The Psychological Contract in Retrospect and Prospect,” 640.

<sup>104</sup> Congress of the United States Congressional Budget Office, “Recruiting, Retention, and Future Levels of Military Personnel,” Pub. No. 2777, October 2006 [www.cbo.gov/ftpdocs/76xx/doc7626/10-05-Recruiting.pdf](http://www.cbo.gov/ftpdocs/76xx/doc7626/10-05-Recruiting.pdf) (accessed March 28, 2010), 28.

“at this time, the high deployment tempo associated with Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) does not appear to be associated with these shortfalls.”<sup>105</sup> A 2008 study conducted by a student at the U.S Navy Postgraduate School found that Army officers who experience deployments are more likely to leave service. Surprisingly, this same study found that deployments to non-hostile locations had greater negative effects on retention than deployments to hostile locations.<sup>106</sup> The literature offers no military-specific turnover models or models specific to any particular field or business. Questions that seek to assess job satisfaction and expected utility of internal and external roles capture the influence of deployments on the stay/leave decision-making process. Further, responses to open-ended questions shed light on the effects that deployments had on the decision to stay.

## Procedures

The U.S. Army Command and General Staff College (CGSC) Quality Assurance Office (QAO) provided oversight and control of the survey. The survey consisted of fifty-three questions administered on the internet. The author created the survey questions using Inquisite© survey software, and a QAO staff employee distributed an email message with a hyperlink to the survey to each member of the target population. Upon entering the link, the first screen informed recipients that participation was both voluntary and confidential. The fifty-three questions consisted of thirteen demographic questions, including rank (Captain, Major, Lieutenant Colonel), commissioning source (Reserve Officer Training Corps [ROTC], United States Military Academy [USMA], Officer Candidate School [OCS]), component (Active Duty, Army Reserve,

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<sup>105</sup> Charles A. Henning, “Army Officer Shortages: Background and Issues for Congress,” (Washington D.C.: Congressional Research Service, 2006), <http://handle.dtic.mil/100.2/ADA462381> (accessed January 15, 2010), Summary.

<sup>106</sup> Serdar Genc, “An Analysis of the Effect of the Global War on Terror on the Retention of United States Military Academy Graduates,” (Monterey: Naval Postgraduate School, March 2008), 79.

Army National Guard), current organization (CGSC, SAMS, BCTP), and undergraduate major/concentration. This final demographic question was a “yes” or “no” question. If the respondent answered “no” to possessing an undergraduate degree in engineering, the survey directed them to the next question. If the respondent answered “yes” to this question, the survey asked follow-on questions relating to graduate schooling and professional accreditation. The remaining survey questions consisted of forty questions pertaining to the measures, three of which were “yes” or “no,” thirty-two of which offered Likert-scale responses, and five of which were open-ended. The Likert scale offered five response choices: Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree. The survey required approximately fifteen minutes to complete. The survey was open for recipients of the email message to respond for eighteen days. The QAO staff employee sent an email during this period to recipients that had yet to respond that reiterated the invitation to participate in the survey.

## **Participants**

The survey population consisted of Army engineer officers currently assigned to Fort Leavenworth, Kansas. It included students attending CGSC, SAMS, and officers assigned to BCTP. The author contacted an officer assigned to CGSC who possessed a list of these individuals, which constituted the survey target population. The first question on the first screen asked if the respondent was currently an Army engineer officer. Its purpose was to verify that all respondents were indeed members of the target population. If a respondent selected “yes,” the survey proceeded. If they selected “no,” the survey prompted the respondent to exit. Since none of the respondents selected “no” to this question, it is reasonable to assume that all of the respondents were currently Army engineer officers. Of the 106 surveys distributed, sixty-four individuals completed the survey resulting in a 60.4% response rate. This response rate equates to

a confidence interval of 94.5% and a margin of error of 5.5%.<sup>107</sup> The typical respondent was a major (92.1%) currently serving on active duty (92.2%). 44.4% of respondents possessed an undergraduate degree in engineering and 55.6% of respondents possessed a non-engineering undergraduate degree.

## Measures

The literature review provided a background of the models and concepts that have emerged in the past fifty years of employee turnover research. As described earlier, the Building Great Engineers campaign plan and working documents suggest engineer officers consider the relative benefits of staying in the Army to what they expect from the civilian sector. This is indicative of the Mobley et al. expanded model of turnover. This model suggests that job satisfaction, the expected utilities of internal roles, and the expected utilities of external roles are primary determinates to turnover. The Mitchell et al. job embeddedness construct approaches the quit or stay decision from a different perspective. Instead of questioning why an employee leaves, it seeks to determine why an employee stays. Job embeddedness is comprised of an individual's links, fit, and sacrifice. Another approach to turnover is the concept of psychological contracts, which draws from previous research in job satisfaction and met expectations. Each employee has unique pre-entry expectations, which unconsciously forms a contract of what employment will be like. The employee compares experiences on the job to these expectations, which affects job satisfaction. Appendix 1 contains the survey questions.

*Job Satisfaction.* Mobley et al. conceptualized job satisfaction as a present-oriented evaluation of the job involving a comparison of an employee's values and the employee's

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<sup>107</sup> CGSC QAO determined the confidence interval and margin of error.

perception of what the job provides.<sup>108</sup> The survey asked ten questions relating to job satisfaction. Example questions include: “The Army values my abilities,” “I am fairly compensated,” and “My experiences have been professionally fulfilling.” Nine of the job satisfaction questions offered responses on a five-point Likert scale. The final question, “I have considered leaving the Army,” offered “Yes” or “No” responses. The survey then asked the question “Please explain” and provided a text box for officers to elaborate upon their response.

*Expected Utility of Internal Roles.* While job satisfaction depends on current perceptions, expected utility of internal roles captures future expectations within the organization.<sup>109</sup> The survey posed two questions to assess this expectation: “My future in the engineer regiment is excellent” and “I am confident I can lead all types of engineer units.” Both questions offered responses on a five-point Likert scale.

*Expected Utility of External Roles.* Mobley et al. considered this determinant of turnover to capture the individual’s expectation of finding an attractive job external to the organization. An individual’s work values, expected attainment of these values from the external job, and the expectation of being able to obtain the external job all influence this determinant.<sup>110</sup> The survey posed eight questions to assess these factors. Examples include: “I’m confident I could find a good job outside of the Army,” “I could secure a job that is more professionally fulfilling outside the Army,” and “I intend to seek employment in my undergraduate discipline upon leaving the Army.” All questions offered responses on a five-point Likert scale.

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<sup>108</sup> William H. Mobley, *Employee Turnover: Causes, Consequences, and Control*, 125.

<sup>109</sup> Ibid., 129.

<sup>110</sup> Ibid., 129.

*Links to organization.* Mitchell et al. describe links as formal or informal connections between the employee and the organization, or the employee and other people.<sup>111</sup> The engineer regiment's campaign plan and working documents suggest that a lack of mentorship, a professional relationship between a senior officer and a junior officer, is a retention factor. Additionally, the effects of modularization may have contributed to an identity crisis for the regiment. The survey posed two questions to assess these factors: "I have a mentor" and "I personally feel a part of the engineer regiment." Both questions offered responses on a five-point Likert scale.

*Fit to organization.* Fit is an employee's perceived compatibility or comfort within an organization.<sup>112</sup> The better an employee feels he or she fits in the organization, the higher the likelihood the employee will feel tied to the organization. The survey posed three questions to assess this factor: "I feel like I am a good match for the branch," "I am similar to other engineer officers," and "I fit within the engineer branch culture." All questions offered responses on a five-point Likert scale.

*Sacrifice.* Sacrifice pertains to the perceived benefits an employee would forfeit if he or she left the organization. The more an employee believes he or she would lose, the less likely they will leave the organization.<sup>113</sup> The survey posed six questions to assess this factor. Examples include: "I would sacrifice a lot if I left the Army" and "My future in the regiment is excellent." All questions offered responses on a five-point Likert scale.

*Pre-Entry Expectations and Post-Entry Experiences.* An employee conceptualizes what service in an organization will be like prior to entering the organization. These expectations are

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<sup>111</sup> Mitchell et al., "Why People Stay: Using Job Embeddedness to Predict Voluntary Turnover," 1104.

<sup>112</sup> Ibid., 1104.

<sup>113</sup> Ibid., 1105.

relevant to turnover since the employee will compare later experiences to these expectations. The survey posed three questions to assess pre-entry expectations: “I thought my duties would require the application of my undergraduate major/concentration,” “It was important to me to utilize my undergraduate major/concentration in my service,” and “I thought my undergraduate major/concentration would be a great value to the Army.” The survey posed three questions to assess post-entry experiences: “My duties have required the application of my undergraduate major/concentration,” “My undergraduate major/concentration is valued by the Army,” and “My experiences have been professionally fulfilling.” All questions offered responses on a five-point Likert scale.

*Psychological contract violations.* The survey sought to assess the compatibility of post-entry experiences to pre-entry expectations. It posed two questions: “My experiences have matched my pre-commissioning expectations” and “My service expectations have changed.” Both questions offered “Yes” or “No” responses and each offered a text box with the question “Please explain” for officers to elaborate upon their responses.

The survey questions are not all discrete, relevant to just one model or concept. Since the elements of the expanded model, job embeddedness, and psychological contracts are interrelated, some questions can apply to multiple aspects. For example, the question “My future in the engineer regiment is excellent” is relevant to both the expected utility of internal roles (future expectations within the regiment) and sacrifice (an opportunity cost of leaving the regiment). Additionally, the final survey question was open-ended: “Is there anything else you wish to comment on.” This provided officers a final opportunity to elaborate upon their responses.

## **Analysis**

Demographic questions delineate responses from officers who possess undergraduate degrees in engineering from officers who possess other undergraduate degrees. This allows a comparison of responses between these two segments of the target population. Additionally, the

CGSC QAO periodically surveys CGSC students. Two questions posed during a 2009 quality of life survey pertaining to job satisfaction were included in this survey verbatim to provide another point of comparison. Appendix 2 contains the survey responses.

*Job Satisfaction.* Responses to four of the ten questions suggest that officers with engineering degrees have lower job satisfaction than those with other degrees. The remaining six questions indicate little or no difference in satisfaction. The most significant difference was in response to the question, “I have given the Army more than it has given me.” 32.1 % of officers with engineering degrees responded favorably to this question while 20% of officers with other degrees responded favorably. Favorable responses are the total of “Strongly Agree” and “Agree” responses. Unfavorable responses were more significantly different. 10.7% of officers with engineering degrees responded unfavorably and 37.1% of officers with other degrees responded unfavorably. Unfavorable responses are the total of “Disagree” and “Strongly Disagree” responses.

The question “The Army values my abilities” received similar favorable responses from both groups (57.1% with engineering degree, 60% with other degree). Yet officers with engineering degrees responded significantly more unfavorably (35.7%) than officers with other degrees (11.5%). The third most significant difference in responses was to the question, “I am fairly compensated.” 60.7% of officers with engineering degrees responded favorably, while 76.5% of officers with other degrees responded favorably. Additionally, 20.4% of officers with engineering degrees responded unfavorably to the question, while 8.8% of officers with other degrees responded unfavorably. The fourth most significant difference was in response to the question “The Army values my knowledge.” 64.3% of officers with engineering degrees responded favorably, while 51.5% of officers with other degrees responded favorably.

The aggregate responses to the two job satisfaction questions taken from the previous quality of life survey suggest that engineer officers have a lower satisfaction with their job compared to the average of all Army officers. The question “The Army provides a satisfying

career” received 89% favorable responses among all officers<sup>114</sup>, and 79.7% among all engineer officers in the survey. The question “The Army is meeting my expectations for a career” received 85% favorable responses among all officers<sup>115</sup>, and 71.9% among all engineer officers. There is no significant difference in responses to either question based upon type of undergraduate degree. The question “The Army provides a satisfying career” received 78.6% favorable responses from engineer officers possessing undergraduate degrees in engineering, and 80% favorable responses from engineer officers possessing other undergraduate degrees. The question “The Army is meeting my expectations for a career” received 67.8% favorable responses from engineer officers possessing undergraduate degrees in engineering, and 74.3% favorable responses from engineer officers possessing other undergraduate degrees.

*Expected Utility of Internal Roles.* Responses to the question “My future in the engineer regiment is excellent” indicates that officers with undergraduate degrees in engineering have lower expectations for future internal roles. Although favorable responses were similar (42.8% for officers with engineering degrees and 37.1% for officers with other degrees), unfavorable responses are significantly different. Unfavorable responses consisted of 28.6% for officers with degrees and 14.3% for officers with other degrees. Both groups possess similar confidence in carrying out future roles. The question “I am confident I can lead all types of engineer units” resulted in 78.6% favorable responses for officers with engineering degrees and 80% favorable responses for officers with other degrees. Unfavorable responses consisted of 7.1% for officers with engineering degrees and 11.5% for officers with other degrees.

*Expected Utility of External Roles.* Responses to four of the eight questions were significantly different and provide mixed indications of perceived external opportunities.

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<sup>114</sup> U.S. Army Command and General Staff College, “Resident Student Quality of Life: AY 2010-01” (Fort Leavenworth: Command and General Staff College, 2009): 5.

<sup>115</sup> Ibid., 3.

Responses to two questions indicate officers with engineering degrees possess lower expected utilities of external roles. More officers with engineering degrees responded unfavorably to “I would be comfortable assuming a civilian job in my undergraduate discipline” than favorably (50% unfavorable, 32.1% favorable). Similarly, these same officers were more likely to respond unfavorably to “I am experienced in my undergraduate discipline” than favorably (50% unfavorable, 32.1% unfavorable). Responses from officers with other degrees were more optimistic. More officers in this group were likely to respond favorably than unfavorably to these two questions.

Responses to the other two other questions indicate that officers with degrees possess higher expected utilities of external roles. The differences in responses to these questions are clear yet not as significant as the first two questions. “Jobs outside the Army are more professionally satisfying” resulted in similar favorable responses, but officers with other degrees were more likely to respond unfavorably (40%) than officers with degrees (25%). Additionally, officers with engineering degrees were more likely to respond favorably to “I intend to seek employment in my undergraduate discipline upon leaving the Army” than officers with other degrees (25% and 14.3%, respectively).

*Links to Organization.* Responses to the two questions indicate differences in the links between officers and the regiment. More officers with engineering degrees responded unfavorably to “I have a mentor” than favorably (39.3% and 50%, respectively). Conversely, officers with other degrees were more likely to respond favorably to this question than unfavorably (42.8% and 31.5%, respectively). This indicates that mentorship is a stronger link to the regiment for officers with other degrees than officers with engineering degrees. The question “I personally feel a part of the engineer regiment” indicated otherwise. Officers with engineering degrees responded more favorably (67.8%) than officers with other degrees (54.3%). Unfavorable responses were similar (25% and 20%, respectively). The responses to links to organizations is useful since it indicates that officers with engineering degrees are less likely to consider

themselves to have a mentor, and officers with other degrees are less likely to feel a part of the engineer regiment.

*Fit to Organization.* Responses indicate an overwhelming majority of officers perceive they are compatible with the engineer regiment. All three questions resulted in favorable responses from both officers with engineering degrees and officers with other degrees. The only differentiation was in response to “I fit within the engineer branch culture.” Officers with engineering degrees provided 82.1% favorable responses to this question, while officers with other degrees provided 65.7% favorable responses.

*Sacrifice.* Five of the six questions pertaining to sacrifice were dual-use questions, discussed in expected utility of internal and external roles previously. The responses indicate officers with engineering degrees perceive departing the Army as less of a sacrifice than officers with other degrees. The remaining question “I would sacrifice a lot if I left the Army” reinforces this position. 53% of officers with other undergraduate degrees believe they would sacrifice a lot, compared to 39.2% of officers with engineering degrees. Likewise, 20.6% of officers with other degrees do not believe they would sacrifice a lot, while 35.7% of officers with engineering degrees do not believe they would sacrifice a lot.

*Pre-Entry Expectations and Post-Entry Experiences.* Responses to these questions resulted in the most significant difference between the two groups. Five of the six questions resulted in responses that were significantly different. Officers with undergraduate degrees in engineering were more likely to believe their duties would require the use of their education (64.3%) than officers with other degrees (17.2%). They also valued this expected use of their education in their service higher than officers with other degrees (60.7% to 20%, respectively). Likewise, they were more likely to expect their education to be a great value to the Army (78.6% to 40%, respectively). Responses to questions concerning post-entry experiences reflect an adjustment of pre-entry expectations. Officers with undergraduate degrees in engineering felt they applied their education less than they had expected (53.6% from 64.3%). More telling, this group

provided more unfavorable responses (39.3%) compared to expectations (10.7%). There were insignificant differences among officers with other undergraduate degrees. The perceived value to the Army for officers with undergraduate degrees in engineering dropped from an expectation of 78.6% to 42.9%. Unfavorable responses increased from zero expectation responses to 35.7% experience responses. Despite this disparity in responses, the majority of officers from both groups responded favorably to the question “My experiences have been professionally fulfilling” (75% of officers with engineering degrees and 80% of officers with other degrees).

*Psychological contract violations.* Responses from officers with other undergraduate degrees showed only a slight difference between pre-entry expectations and post-entry experiences. As a group, their expectations concerning the application of their education matched their experiences. Consequently, 68.6% provided favorable responses to the question “My experiences have matched my pre-commissioning expectations.” Responses from officers with undergraduate degrees in engineering showed a significant difference between expectations and experiences. This resulted in 46.4% favorable responses and 53.6% unfavorable responses. Officers formed pre-entry expectations from a variety of sources. The most commonly reported sources were cadre at pre-commissioning institutions, branch briefs or displays, enlisted service experience, and summer training events. Responses to open-ended questions reveal these expectations, viewed in hindsight, were often incomplete or inadequately considered. One response that reflects a common view is “I didn’t have a clear picture of what duties would be required of an Engineer officer as a cadet.” Responses indicate that expectations of service changed for many officers. Five responses shared the view that expectations evolved placing a larger emphasis on leadership than technical competence. One response is indicative of this view: “My expectations of the Army have shifted to more leadership and managerial experience that have developed me as a professional officer and not specifically as an Engineer.”

## Summary

The survey posed questions informed by the expanded model of turnover, and the concepts of job embeddedness and psychological contracts. The responses to the questions informed by the expanded model and psychological contracts provide the most illumination of the stay/leave decision. The responses to the questions informed by job embeddedness resulted in the least differentiation. The survey indicates that officers possessing undergraduate degrees in engineering have a greater propensity to leave the Army than officers possessing other undergraduate degrees do.

Officers who possess undergraduate degrees in engineering are less satisfied than officers who possess other undergraduate degrees. These engineer officers are also less satisfied than officers across the Army. Factors that contribute to this relative disparity include dissatisfaction with compensation, and a belief the Army does not value their knowledge or abilities. These factors contribute to the belief they have given more to the Army than received in return. Although these officers are confident in their ability to succeed in positions of greater responsibility, they are more pessimistic about their future service in the Engineer Regiment. They are confident in their ability to transition into a civilian career if they so chose.

Several factors temper this propensity to leave the Army. The most significant factor is satisfaction with their job. This is not a contradiction to the previous paragraph. Although officers with undergraduate degrees in engineering are less satisfied than officers with other degrees and officers across the Army, they assess their career to be fulfilling and more satisfying than opportunities in the civilian sector. Another factor that affects the stay/leave decision involves their assessment of their engineering expertise. Less than a third of officers in this group believe they are experienced in their undergraduate discipline, and less than half are confident in their undergraduate discipline. In addition, only 11.1% of officers had completed the professional engineering exam. These factors surely contributed to the fact that only a quarter of officers with

engineering degrees intend to seek employment in engineering upon leaving the Army. How the Army has employed these officers has surely contributed to this situation. Officers indicated in the survey all the types of engineer units they had served in, including units the Engineer Regiment considers would benefit from having degreed engineers assigned. There was no discernable difference in selections between officers possessing degrees in engineering and officers possessing other degrees. This is a result of the diverse roles and missions of the Engineer Regiment and an assignment process that did not place officers who possess engineering degrees in positions that best matched their education. These officers may have missed an opportunity to develop professionally in their discipline, potentially increasing their experience and confidence in their field.

Officers possessing engineering degrees are significantly more likely to perceive a psychological contract violation. They possess higher pre-commissioning expectations regarding the use of their education and value of their education by the Army. As a group, they assess their duties have insufficiently utilized their education and is undervalued. As a result, a majority of these officers believe their experiences do not match their expectations. Despite this belief, they did not leave the Army. Each contract is unique, formed by explicit and implicit interactions with the Army both prior to and after entry into the Army. Their contract with the Army changed during the course of their career. They regard other aspects of their job as more important than their pre-commissioning expectations. These other aspects are evident in the responses they provided to open-ended questions. Common remarks indicate an acceptance of lower-than-expected technical needs within the Engineer Regiment, that leadership is more critical than technical abilities, a negative perception of civilian job opportunities, and a desire to continue service after the events of September 11, 2001 and subsequent wars.

Responses to questions informed by the concept of job embeddedness are less conclusive. Overall, officers with engineering degrees are less “stuck” in their role in the Army. Officers with engineering degrees are less likely to believe they have a mentor. This results in these officers

having less links to the organization, which increases their propensity to leave. Mitigating this factor is the fact these same officers are more likely to feel a part of the Engineer Regiment, and identify more strongly with its culture. This contributes to a greater fit to the organization and decreases their propensity to leave. The most significant aspect of job embeddedness is their assessment of sacrifice in leaving service. They feel they would forfeit less if they chose to leave the Army than officers possessing other undergraduate degrees. This factor certainly relates to dissatisfaction with compensation, and the belief the Army does not value their knowledge or abilities.

## **Conclusion**

The survey suggests that Army engineer officers who possess engineering degrees did not remain in the Army because they had the opportunity to “use” their degree during their service. In fact, only half of these officers believe their duties required the use of their undergraduate discipline. There is no single answer to why these officers chose to remain in the Army. They stayed for a variety of reasons. As a group, their experiences did not meet their expectations, they were optimistic in their ability to find good jobs in the civilian sector, and were relatively dissatisfied with pay and the perceived value of their education to the Army. The survey indicates that despite these facts they stayed because they found their service in the Army to be fulfilling and are satisfied with their career.

There is no “magic bullet” policy change that will increase retention. The Building Great Engineers effort is certainly holistic in scope, affecting policies in recruiting, training, employment, and other aspects that influence retention. Mobley et al. suggested that employers must endeavor to understand what its employee’s value in order to implement strategies designed

to retain them.<sup>116</sup> This understanding, like each officer's values and perceptions, is dynamic. The stay/leave decision is a highly individualized and continuous process. Therefore, initiatives to affect this process must consider this nature.

The Engineer Regiment can decrease incidences of contract violations by providing cadets with realistic representations of what service in the Army will be like. Merely highlighting the diversity of the branch is insufficient. Among these potential future engineer officers are individuals who highly value the prospect of utilizing their discipline in the conduct of their duties. The future satisfaction of these officers is dependent upon placing them in positions that allow them to apply their discipline. To the extent feasible, explicit and implicit signals about their future roles should accurately match what they will realistically experience if they enter the regiment.

Matching officers with engineering degrees to positions they are more likely to utilize their education can increase job satisfaction for officers that value this experience. This action could have other, negative implications for the regiment. If engineer leaders are successful in placing officers with engineering degrees into positions that provide the opportunity to utilize their education, these officers may become more confident and gain more experience. This may increase officer perceptions of the utility of external roles and negatively influence retention efforts.

As a group, mentoring of engineer officers is lacking. This supports previously stated views that the Army's transformation initiatives altered the identity of the regiment. Increased mentoring can help increase perceived links to regiment, decreasing propensity to leave. The author recommends not viewing the engineer officer corps as a homogenous group. Since officers with engineering degrees are significantly less likely to believe they have a mentor, perhaps these

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<sup>116</sup> William H. Mobley, *Employee Turnover: Causes, Consequences, and Control*, 128.

officers possess greater expectations of what a professional relationship with a senior officer should entail. Perhaps they have specific needs that senior officers do not recognize or fulfill.

It is encouraging that as a group, officers feel their career in the regiment is rewarding, more so than civilian job opportunities. What merits further investigation is the more pessimistic attitude that officers with engineering degrees have to their future in the regiment. Mobley et al. suggested that currently satisfied employees might have negative expectations of their future in an organization.<sup>117</sup> While a stated goal of the campaign plan is to prevent alienation of non-degreed engineers, leaders should consider messages that target degreed engineers.

The Engineer Regiment's effort to increase technical competence is a long-term endeavor to meet anticipated needs during future operations. The campaign plan states, "this effort requires continual program assessment."<sup>118</sup> The author recommends the regiment conduct a series of studies to assess officer values, satisfaction, and met expectations to assess how initiatives influence retention throughout this effort. These studies should include surveys of cadets at pre-commissioning institutions and officers in the Army. Perhaps this monograph contributes towards this assessment effort.

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<sup>117</sup> Ibid., 129.

<sup>118</sup> U.S. Army Engineer School, "Building Great Engineers Campaign Plan," 3.

## APPENDIX 1: Survey

### Engineer Officer Survey

I am a student attending the School of Advanced Military Studies (SAMS). I am conducting research on retention of Army engineer officers.

If you are not a U.S. Army engineer officer this survey was sent to you in error - please do not take this survey.

Your help is important. This survey will take approximately 15 minutes to complete.

This survey is both voluntary and confidential.

Thank you for your participation.

If you have questions, please contact: Maria L. Clark at (913) 684-7332 or email [maria.clark1@conus.army.mil](mailto:maria.clark1@conus.army.mil)

This survey has been approved by the Command and General Staff College Quality Assurance Office. The Survey Control number is 10-055.

Are you currently a U.S. Army engineer officer?

{Choose one}

☐ Yes ☐ No

### Administrative Data

Rank

{Choose one}

☐ CPT ☐ MAJ ☐ LTC

Commissioning Source

☐ ROTC ☐ USMA ☐ OCS

Component

☐ Active Duty ☐ USAR ☐ ARNG

Organization

☐ CGSC ☐ SAMS ☐ BCTP ☐ Other

Undergraduate Degree and Major/Concentration (please be specific)

{Enter answer in paragraph form}

My undergraduate major/concentration is in engineering

☐ Yes ☐ No

I have a graduate degree in engineering

☐ Yes ☐ No

I have completed a Fundamentals of Engineering (FE) exam

☐ Yes ☐ No

I have completed a Principles and Practice in Engineering (PE) exam

☐ Yes ☐ No

Units you have served in (select all that apply)

{Choose all that apply}

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> BCT Engineer Company       | <input type="checkbox"/> Geospatial Team           | <input type="checkbox"/> Engineer Battalion HQ    |
| <input type="checkbox"/> Engineer Brigade HQ        | <input type="checkbox"/> Theater Engineer Cmd      | <input type="checkbox"/> Sapper Company           |
| <input type="checkbox"/> Mobility Augmentation Co   | <input type="checkbox"/> Clearance Company         | <input type="checkbox"/> Eng Support Company      |
| <input type="checkbox"/> Horizontal Construction Co | <input type="checkbox"/> Vertical Construction Co  | <input type="checkbox"/> Multirole Bridge Company |
| <input type="checkbox"/> Survey and Design Team     | <input type="checkbox"/> Concrete Section          | <input type="checkbox"/> Asphalt Team             |
| <input type="checkbox"/> Firefighting Team          | <input type="checkbox"/> Explosive Hazards Team    | <input type="checkbox"/> Diving Team              |
| <input type="checkbox"/> Topo Co or Planning Cell   | <input type="checkbox"/> Construction Mgt Team     | <input type="checkbox"/> Engineer Facilities Det  |
| <input type="checkbox"/> Prime Power Company        | <input type="checkbox"/> Well-Drilling Team        | <input type="checkbox"/> Quarry Platoon           |
| <input type="checkbox"/> Real Estate Team           | <input type="checkbox"/> Forward Engineer Spt Team |   |

### Expectations

This section focuses on your pre-commissioning expectations and beliefs

Answer the following questions based on what you believed prior to entering the Army as an officer:

I thought my duties would require the application of my undergraduate major/concentration

☐ Strongly Agree ☐ Agree ☐ Neither Agree nor Disagree ☐ Disagree ☐ Strongly Disagree

It was important to me to utilize my undergraduate major/concentration in my service

☐ Strongly Agree ☐ Agree ☐ Neither Agree nor Disagree ☐ Disagree ☐ Strongly Disagree

I thought my undergraduate major/concentration would be a great value to the Army

☐ Strongly Agree ☐ Agree ☐ Neither Agree nor Disagree ☐ Disagree ☐ Strongly Disagree

How long did you believe you would serve before leaving the Army?

☐ Initial obligation only ☐ Serve obligation, then perhaps some more  
☐ Until retirement

What was your primary source of information of what service as an engineer officer would be like?

- ☐ Peers that had entered service ☐ Cadre at my pre-commissioning institution  
☐ Enlisted service experience ☐ Family member  
☐ Cadet Troop Leader Training (CTLT) or similar summer program ☐ Branch brief or display  
☐ Other [ ]

Was the engineer branch your first choice?

☐ Yes ☐ No

Which choice was it?

☐ 2<sup>nd</sup>      ☐ 3<sup>rd</sup>      ☐ 4<sup>th</sup>      ☐ 5<sup>th</sup>      ☐ Other [      ]

If you have any comments to make about your pre-commissioning expectations or beliefs, please provide them here:

{Enter answer in paragraph form}

### Experiences

This section focuses on your post-commissioning experiences and beliefs

Answer the following questions based on your current assessment of your career experiences:

My duties have required the application of my undergraduate major/concentration

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐ Strongly Disagree

My undergraduate major/concentration is valued by the Army

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐ Strongly Disagree

My experiences have matched my pre-commissioning expectations

☐ Yes      ☐ No

Please explain

{Enter answer in paragraph form}

My service expectations have changed

☐ Yes      ☐ No

Please explain

{Enter answer in paragraph form}

Please respond to the statements below to the best of your ability:

I have a mentor

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐ Strongly Disagree

I am similar to other engineer officers

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐ Strongly Disagree

My job utilizes my technical knowledge well

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐ Strongly Disagree

The Army values my abilities

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐ Strongly Disagree

I feel like I am a good match for the branch

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

I would sacrifice a lot if I left the Army

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

I am fairly compensated

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

My future in the engineer regiment is excellent

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

My experiences have been professionally fulfilling

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

I fit within the engineer branch culture

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

The Army provides a satisfying career

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

I am confident I can lead all types of engineer units

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

I could secure a job that is more professionally fulfilling outside of the Army

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

I would be comfortable assuming a civilian job in my undergraduate discipline

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

I'm confident I could find a good job outside of the Army

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

Jobs outside the Army are more professionally satisfying

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

I have given the Army more than it has given me

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

I personally feel a part of the engineer regiment

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

The Army is meeting my expectations for a career

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

Please respond to the statements below to the best of your ability:

My undergraduate major/concentration has been critical to the performance of my duties

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

I am competent in my undergraduate discipline

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

I am experienced in my undergraduate discipline

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

I am confident in my undergraduate discipline

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

I intend to seek employment in my undergraduate discipline upon leaving the Army

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

The Army values my knowledge

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

The Army values my skills

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

My professional needs are important to the Army

☐ Strongly Agree      ☐ Agree      ☐ Neither Agree nor Disagree      ☐ Disagree      ☐  
Strongly Disagree

I have considered leaving the Army

☐ Yes      ☐ No

Please explain

{Enter answer in paragraph form}

Is there anything else you wish to comment on?

{Enter answer in paragraph form}

## Survey Complete

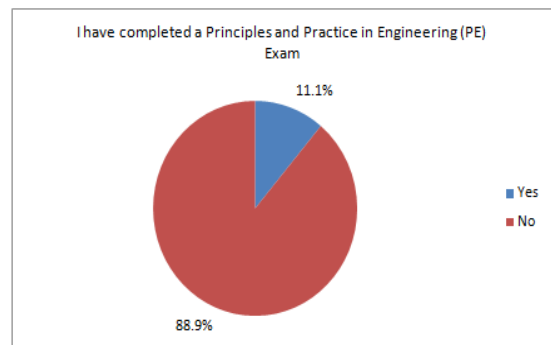
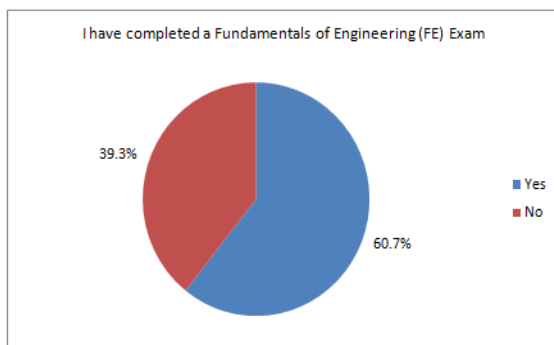
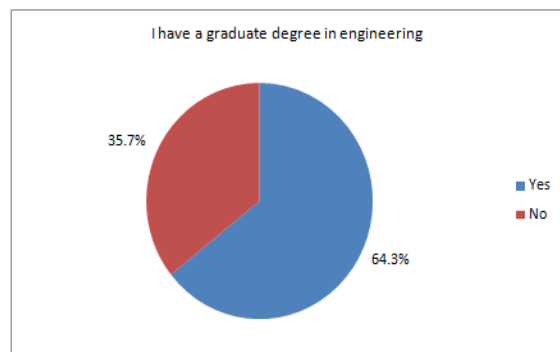
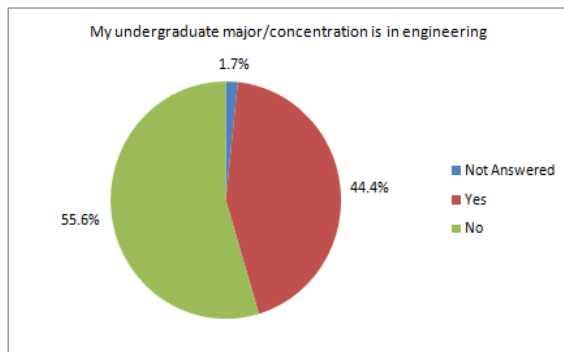
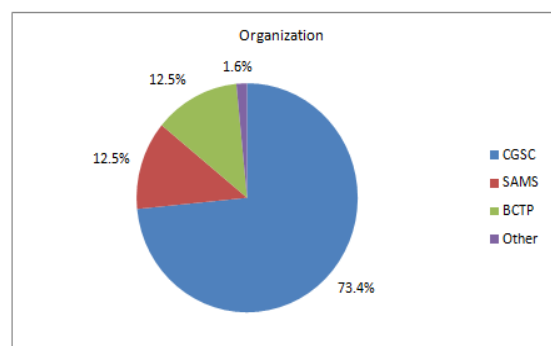
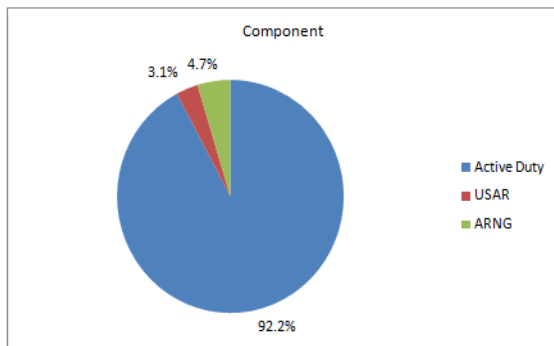
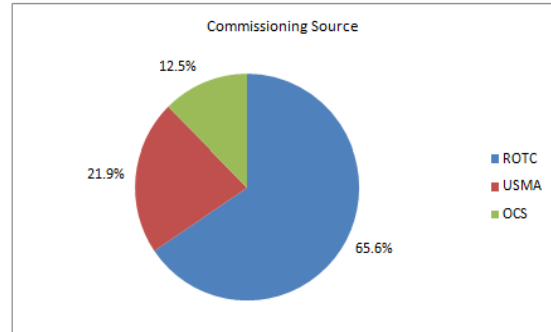
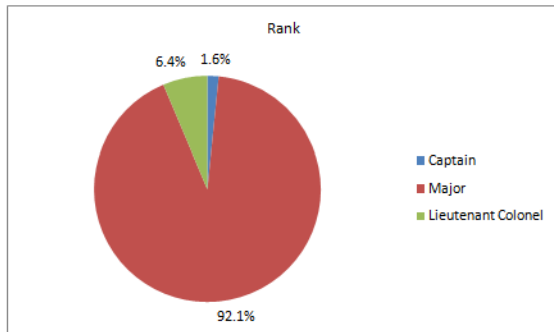
Thank you for participating.

If you have any questions about this survey, please contact MAJ Steve Kolouch at email [stephen.kolouch@us.army.mil](mailto:stephen.kolouch@us.army.mil)

Please submit your responses by clicking the "Finish" button at the bottom of your screen.

## APPENDIX 2: Survey Results

### *Demographic Questions.*



Units you have served in (Select all that apply)

Yes – My undergraduate major/concentration is in engineering.

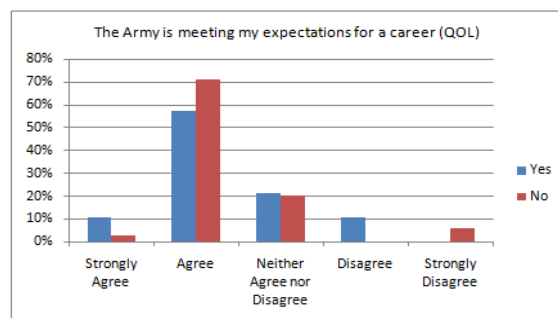
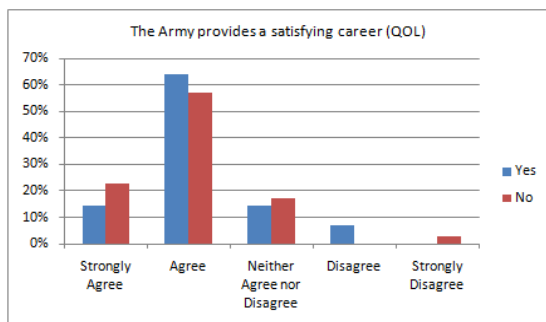
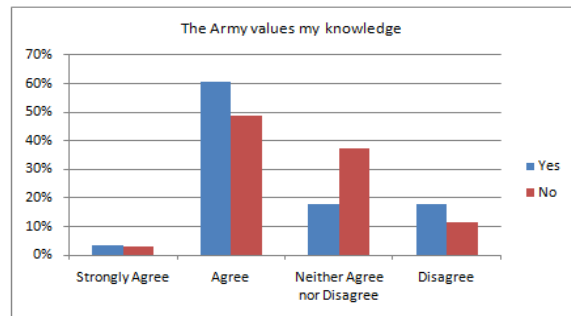
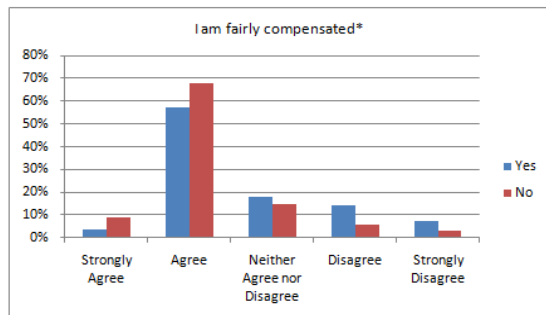
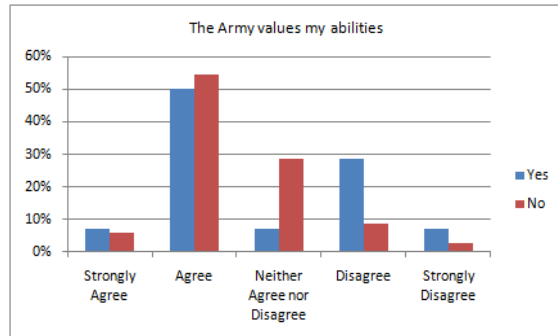
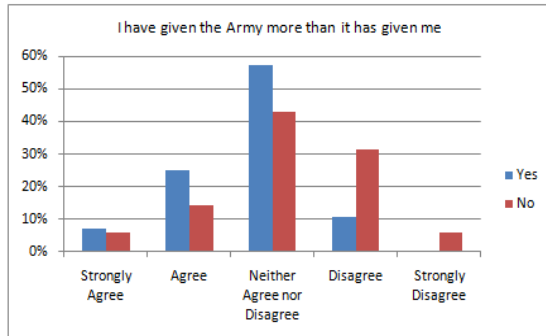
	Count	Percent
BCT Engineer Company	9	8.7%
Geospatial Team	1	1.0%
Engineer Battalion HQ	23	22.1%
Engineer Brigade HQ	17	16.4%
Theater Engineer Cmd	1	1.0%
Sapper Company	20	19.2%
Mobility Augmentation Co	2	1.9%
Eng Support Company	6	5.8%
Horizontal Construction Co	5	4.8%
Vertical Construction Co	2	1.9%
Multirole Bridge Company	3	2.9%
Survey and Design Team	3	2.9%
Firefighting Team	2	1.9%
Explosive Hazards Team	1	1.0%
Topo Co of Planning Cell	3	2.9%
Construction Mgt Team	4	3.9%
Prime Power Company	1	1.0%
Forward Engineer Spt Team	1	1.0%

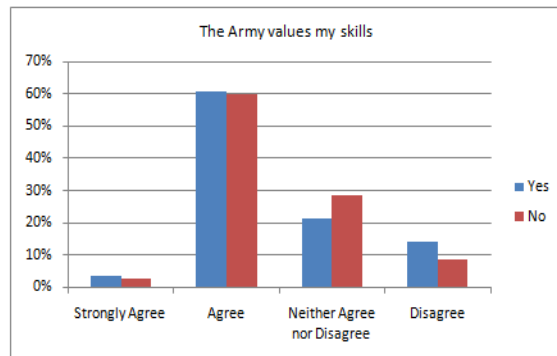
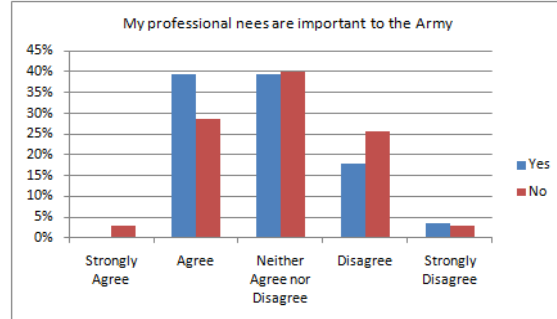
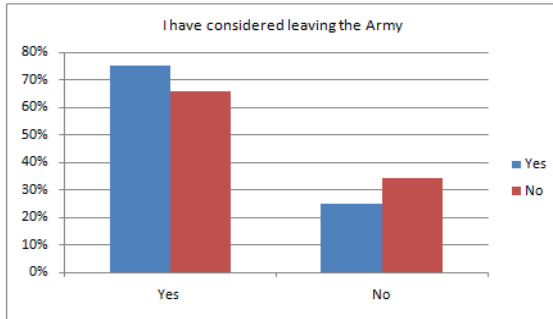
No – My undergraduate major/concentration is in engineering.

	Count	Percent
BCT Engineer Company	18	17.5%
Geospatial Team	1	1.0%
Engineer Battalion HQ	31	30.1%
Engineer Brigade HQ	10	9.7%
Theater Engineer Cmd	3	2.9%
Sapper Company	20	19.4%
Clearance Company	2	1.9%
Eng Support Company	2	1.9%
Horizontal Construction Co	8	7.8%
Vertical Construction Co	5	4.9%
Explosive Hazards Team	1	1.0%
Construction Mgt Team	2	1.9%

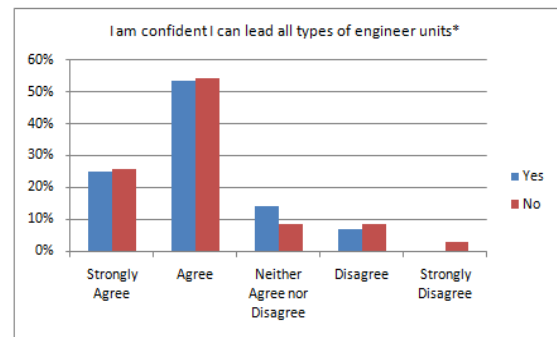
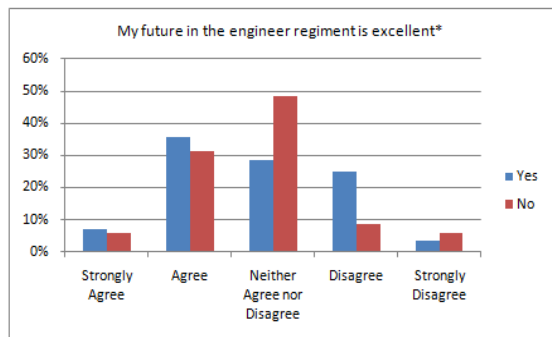
“Yes” consists of twenty-eight respondents who answered “yes” to “My undergraduate major/concentration is in engineering.” “No” consists of thirty-five respondents who answered “no” to “My undergraduate major/concentration is in engineering.” “QOL” indicates questions drawn from the 2009 CGSC QAO Quality of Life Survey. “\*” indicates dual-use questions.

### *Job Satisfaction Questions.*

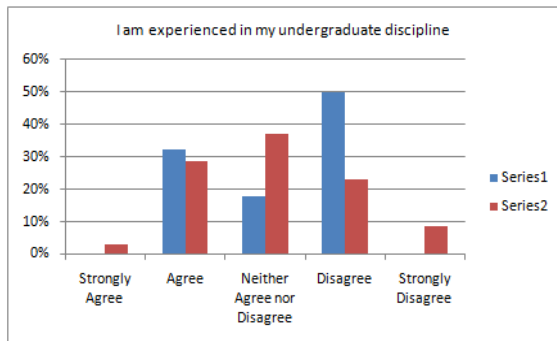
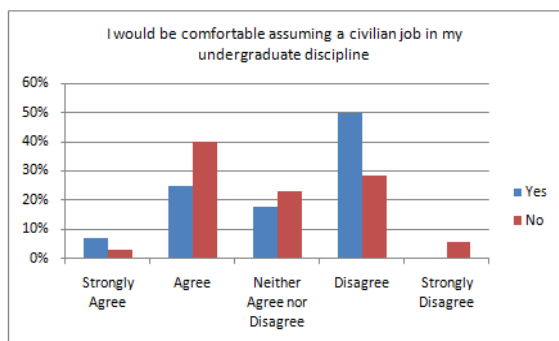


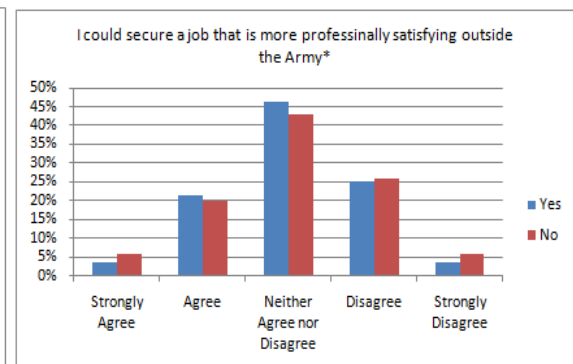
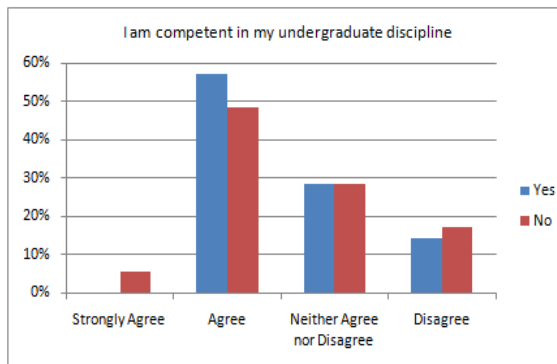
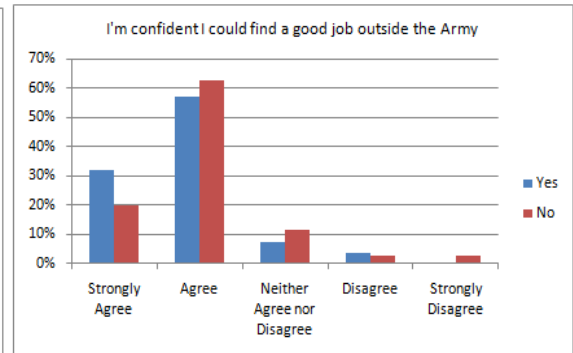
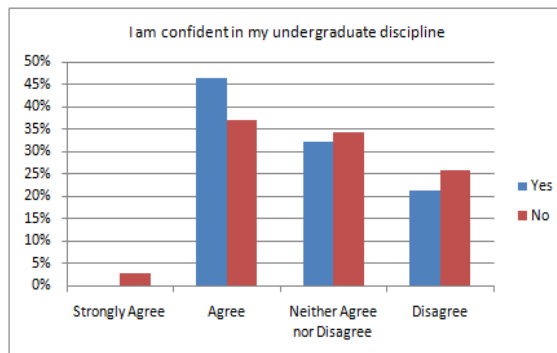
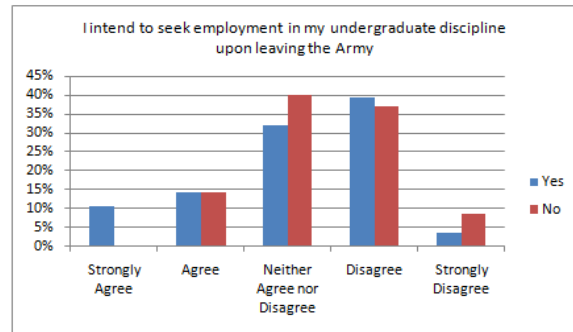
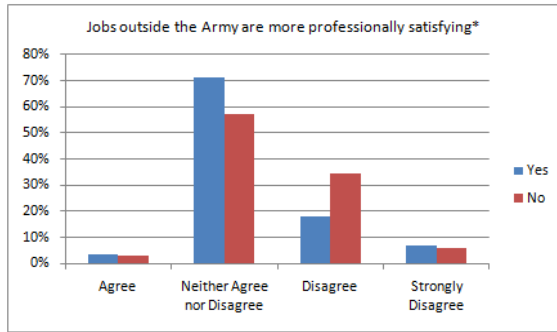


### *Expected Utility of Internal Roles Questions.*

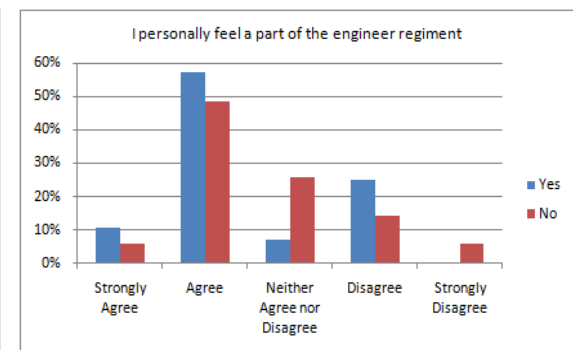
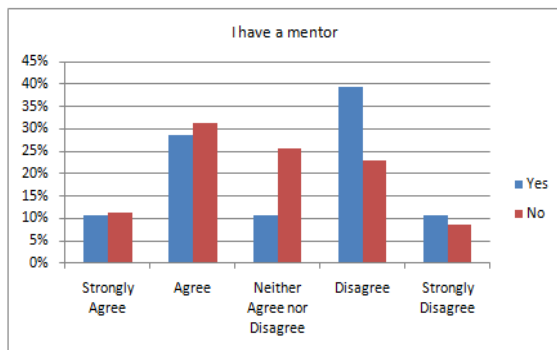


### *Expected Utility of External Roles Questions.*

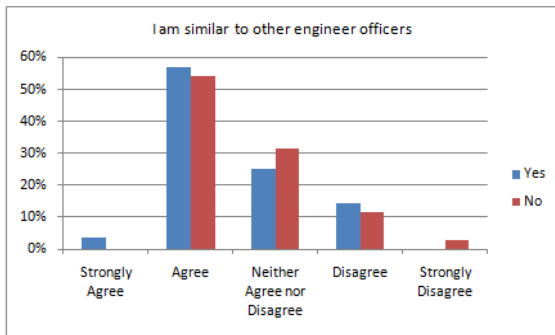
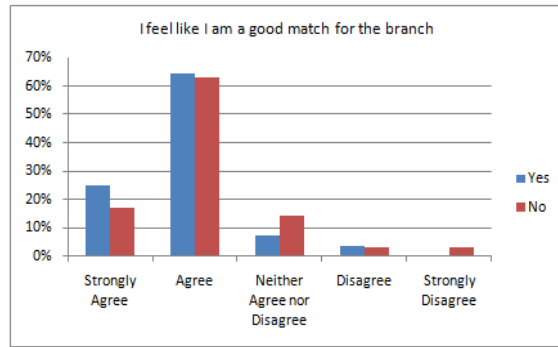
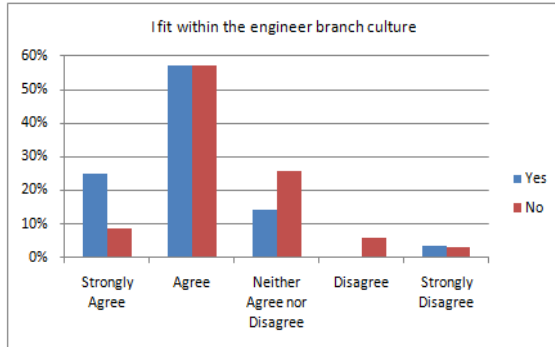




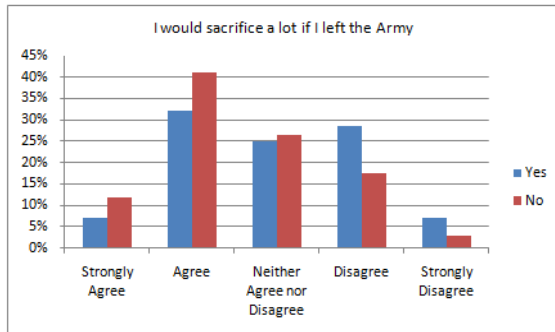
### *Links to Organization Questions.*



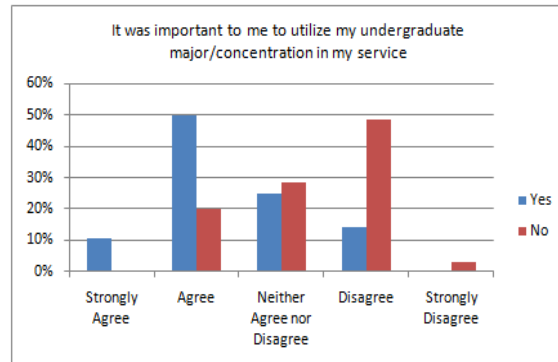
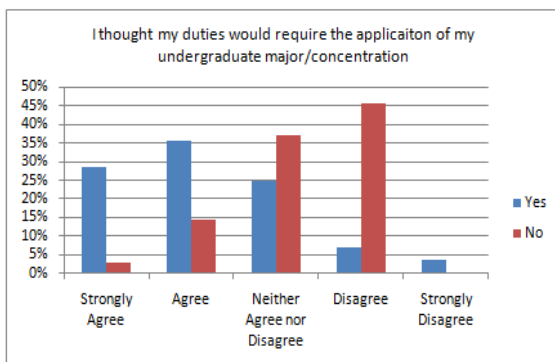
### *Fit to Organization Questions.*

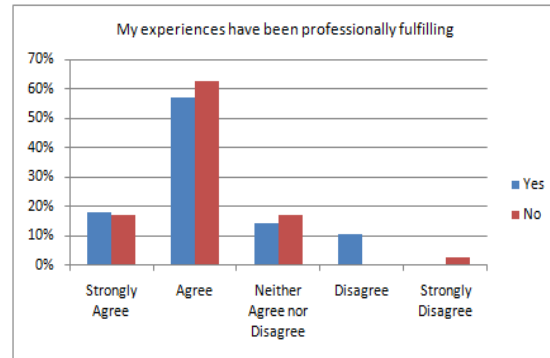
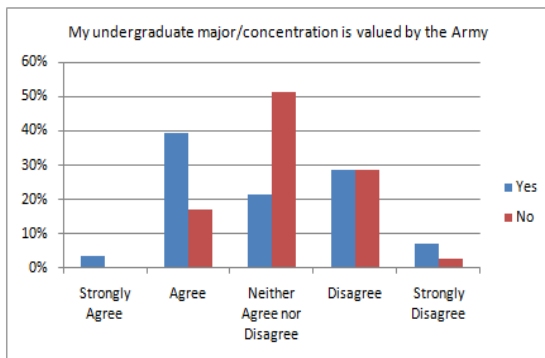
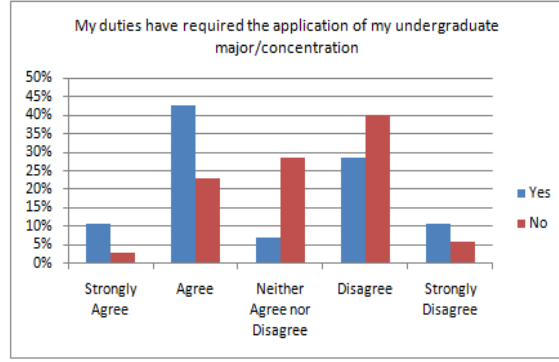
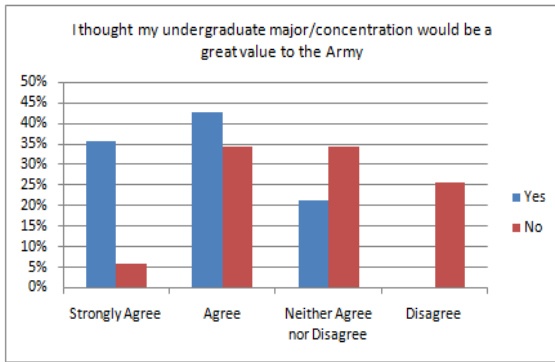


### *Sacrifice Question.*

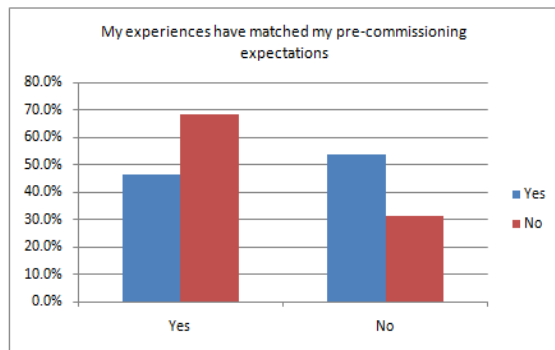


### *Pre-Entry Expectations and Post-Entry Experiences Questions.*





### *Contract Violation Questions.*



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